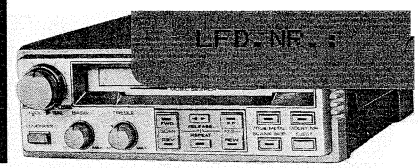
PIONEER®

Service Manual



ORDER NO.
CRT-274-0

COMPONENT CAR STEREO CASSETTE DECK

KP-909G

US, CA, E

NOTE: The P.C.Board in the Control Unit have been changed as follows:

KP-909G/US	Serial No. 00001 ~ 01000*	Serial No. 01001 and after
KP-909G/CA	———	Serial No. 00001 and after
KP-909G/E	Serial No. 00001 ~ 04000*	Serial No. 04001 and after

*Refer to page 45 ~ 51 for the schematic circuit diagram, Control unit and parts list.

SPECIFICATIONS

General

Power source ..... DC 14.4V (10.8 ~ 15.6V allowable)
Grounding system ..... Negative type
Dimensions ..... 150(W) X 50(H) X 159(D) mm
(5-7/8(W) X 2(H) X 6-1/4(D) in.)
Weight ..... 1.9 kg (4.2 lbs.)
Tone control (bass) ..... ±10 dB (100 Hz)
(treble) ..... ±10 dB (10 kHz)
Loudness contour ..... +12 dB (100 Hz), +4 dB (10kHz)
(volume: –30 dB)
Maximum output level ..... 200 mV
Output impedance ..... 1 kΩ

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

Tape Player

Tape ..... Compact cassette tape (C-30 ~ C-90)
Tape speed .... 4.76 cm/sec. (+0.14 cm/sec. –0.05 cm/sec.)
Fast forward/rewind time ..... Approx. 100 sec. for C-60
Wow & flutter ..... 0.07% (WRMS)
Frequency response ..... Metal: 30 ~ 20,000 Hz (±3 dB)
Normal: 30 ~ 16,000 Hz (±3 dB)
Stereo separation ..... 40 dB
Signal-to-noise ratio . . . Dolby NR IN: 63 dB (IHF-A network)
(KP-909G/US,CA) Dolby NR OUT: 55 dB (IHF-A network)
Signal-to-noise ratio . . . Dolby NR IN: 63 dB (IEC-A network)
(KP-909G/E) Dolby NR OUT: 55dB (IEC-A network)

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers. (KP-909G/US)

- 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing corporation.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

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KP-909G

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CAUTION
When Handling IC TC9130P and PD6009A
Please observe:
IC TC9130P and PD6009A (IC3 and IC4 in the control unit) are C-MOS ICs of extremely low power consumption and very high input impedance. Unless handled with special care, they could be damaged by static electricity induction. These ICs are supplied with a shorting cap (of aluminium foil) attached. When soldering or performing other repair work, always attach this cap. Remove the cap after the repair has been completed.
Also, this type of IC must not be inserted in a polystyrene package for storage.

1. PARTS LOCATION

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*

★★ : GENERALLY MOVES FASTER THAN ★.

This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

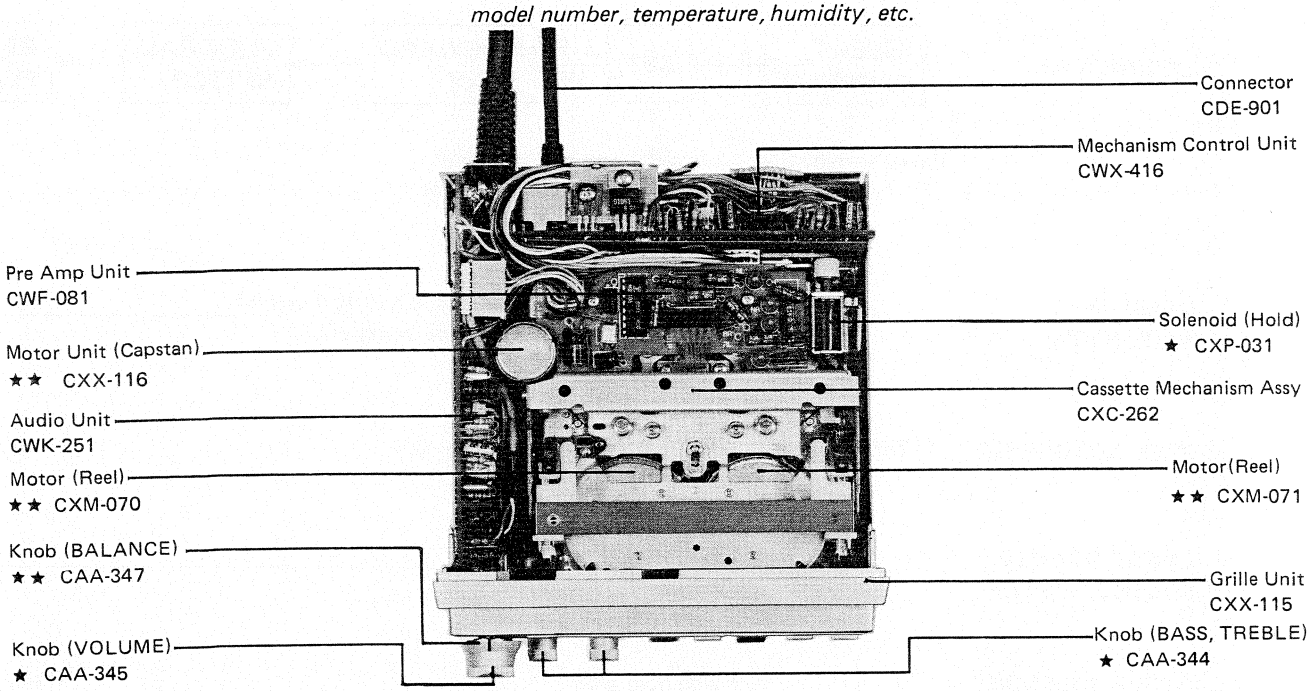


Fig. 1

2. LEVEL DIAGRAM

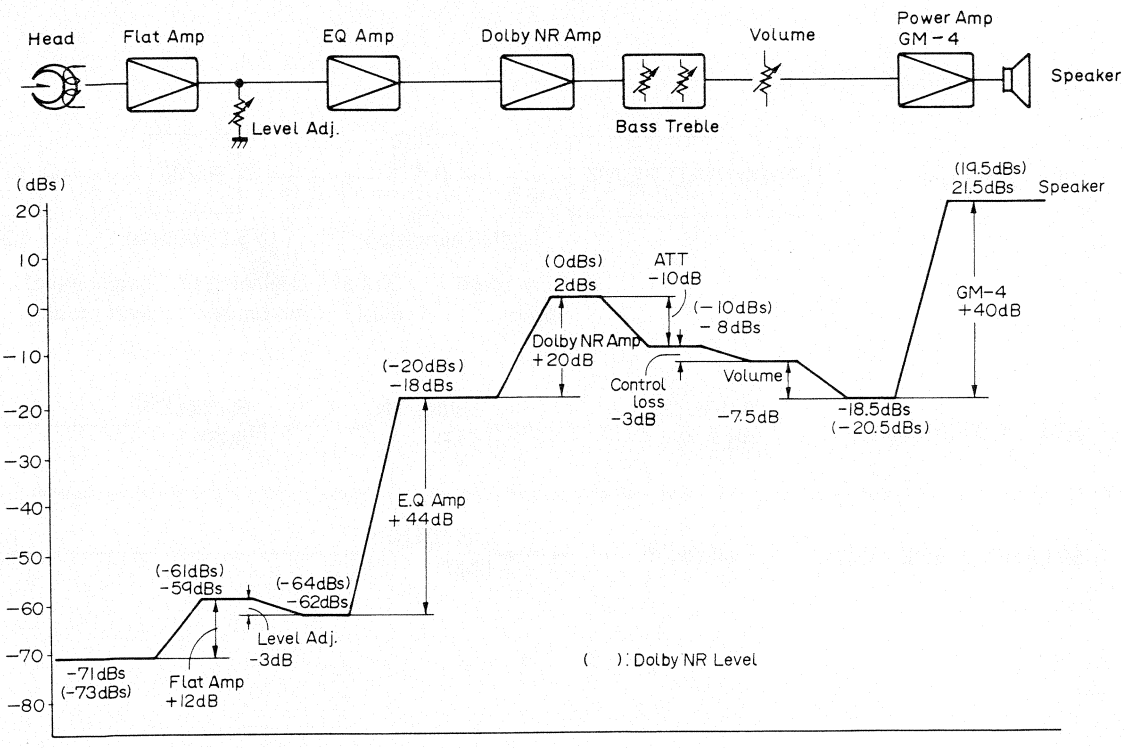
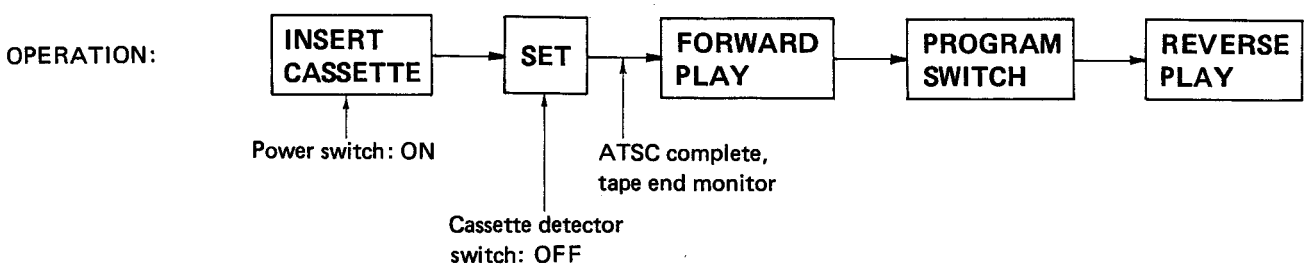


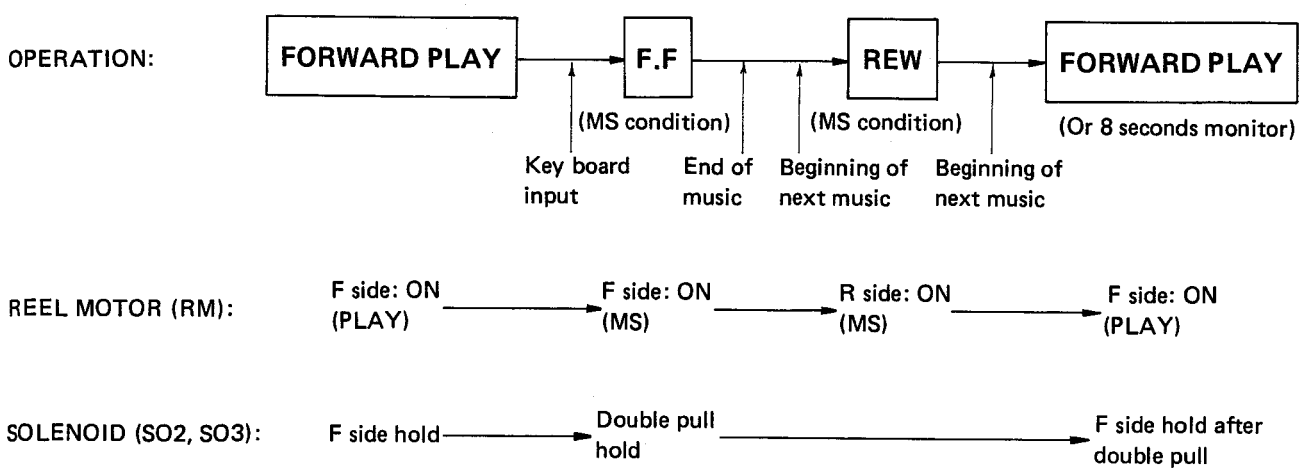
Fig. 2

3. OPERATION EXPLANATION

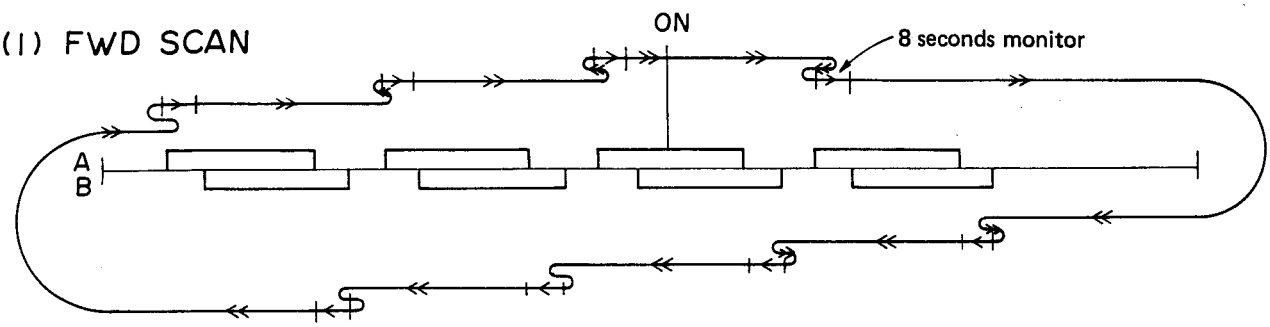
① Insert Cassette → Forward Play (F side) → Program Switch → Reverse Play (R side)



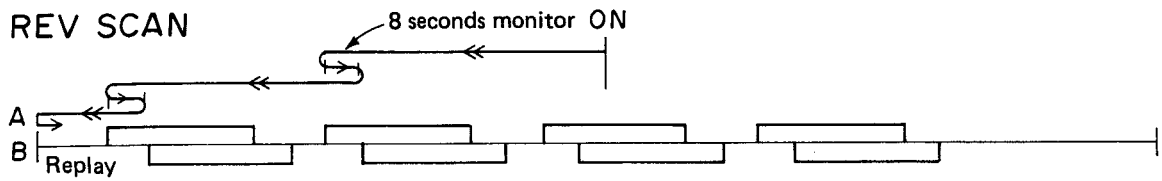
② During F.F MS or SCAN



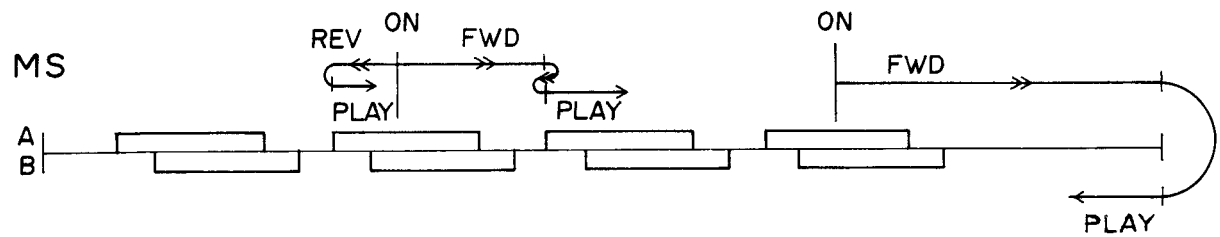
(1) FWD SCAN



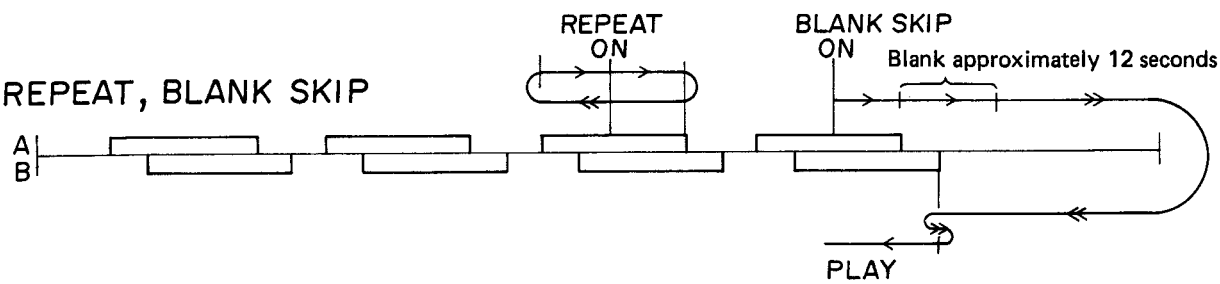
(2) REV SCAN



(3) MS



(4) REPEAT, BLANK SKIP



A and B represent the A and B sides of the cassette.

A side moves in the direction of ⟶

⟶ or ⟵ indicates PLAY condition.

⟶⟶ or ⟵⟵ indicates F.F or REW (for MS condition).

▭ indicates music portion

4. CIRCUIT DESCRIPTION

• Block Diagram

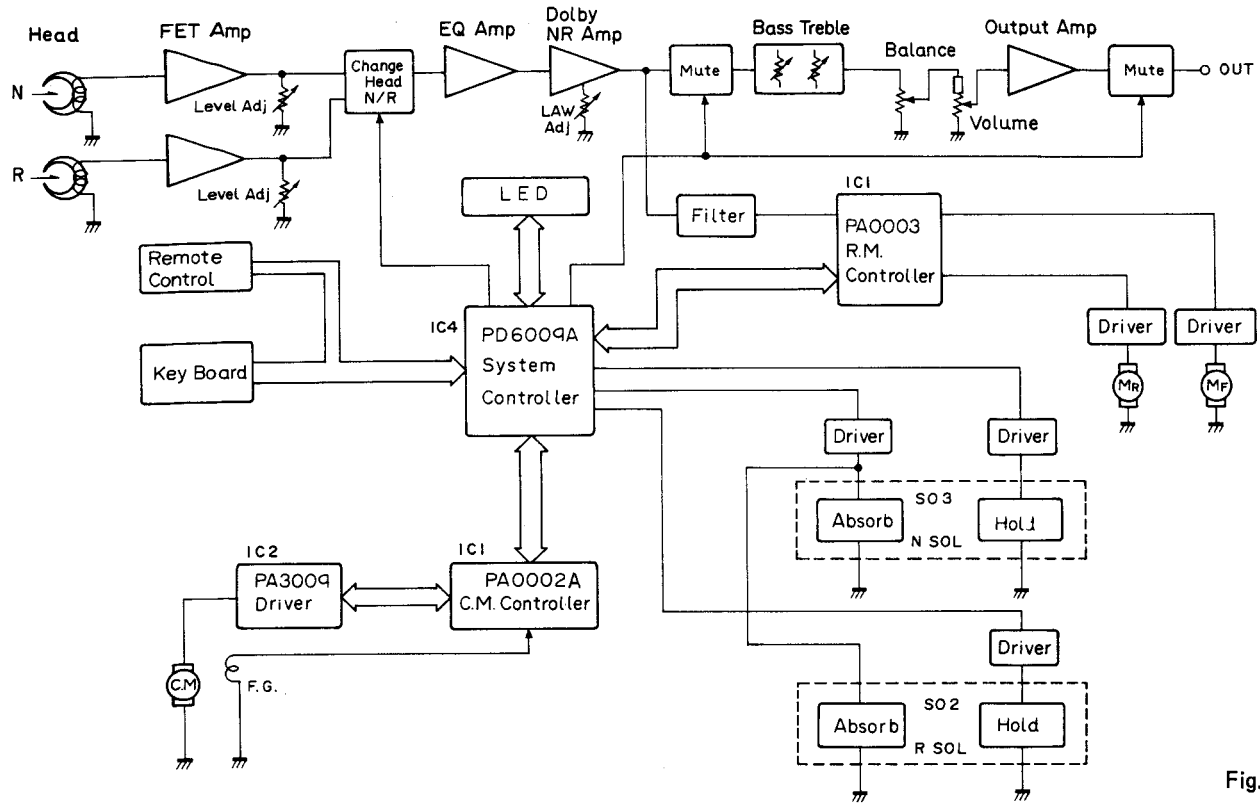


Fig. 3

This system uses several ICs for electronic control of the cassette mechanism. PD6009A controls the CPU of this system. The CPU receives keyboard (or remote control terminal) input and receives information from the RM controller and outputs instructions to the respective controller or drivers to operate the reel motor, capstan motor, solenoids and LED correctly.

Also, F/R switching and MUTE operation are performed in accordance with instructions from the CPU. The RM controller receives instructions from the CPU and controls the reel motor and also monitors the information from the reel motor and the MS signal input which is sent to the CPU. The CM controller controls the capstan motor via the CM driver using instructions from the CPU. The audio section is basically similar to previous models but since the heads are 4 ch, with FET amp coupling, those 4 signals are switched in the F/R switching circuit of the rear stage. Next, the PD6009A terminals are explained. (Refer to page 22.)

TERMINAL NUMBER	SYMBOL	FUNCTION
1	$\overline{\text{R.SOL}}$	Reverse solenoid drive output (Hold side). Absorbed at L.
2	$\overline{\text{B.SOL}}$	Absorb side solenoid drive output (F/R simultaneously). Absorbed at L.
3	$\overline{\text{EJ·OUT}}$	Becomes L when an eject signal is input to pin 4 from the keyboard, etc.
4	$\overline{\text{EJ·IN}}$	Pin 3 becomes L when an eject signal is input using L. Takes priority over all other key inputs.
6	$\overline{\text{F·F MS}}$	LED output
7	$\overline{\text{REW MS}}$	LED output
8	F·F	Increases reel motor speed to F·F (REW) condition using H.
9	PLAY	P/F·F MS terminal. Switches the servo amp of the reel motor using PLAY and F·F MS. PLAY using H.

TERMINAL NUMBER	SYMBOL	FUNCTION
10	F, M STP	Forward side reel motor stop terminal. STOP using H.
12	R, M STP	Reverse side reel motor stop terminal. STOP using H.
13 to 16	K0 to K3	Key sense input
17	Vcc	5V ± 0.5V
20 and 21	Extal, xtal	Clock 3.00MHz ± 0.2%.
22	EN	Entire system start terminal. START using H. All output terminals are H using L.
23	END SENS	End monitor input terminal. Determines termination when more than 1 second passes with no pulse input.
27	MS,SENS	MS monitor input terminal. Inputs music time monitor pulse. During PLAY, a condition of more than 3 seconds without pulse input is considered music time.
28 and 29	P0 and P1	Key scan output signal.
31	P2	Switch scan output signal.

TERMINAL NUMBER	SYMBOL	FUNCTION
33	$\overline{F{\cdot}F}$	LED output
34	$\overline{REW}$	LED output
35	$\overline{F, SCAN}$	LED output
36	$\overline{R, SCAN}$	LED output
37	$\overline{REV}$	LED output
39	$\overline{REPEAT}$	LED output
40	$\overline{FOR}$	LED output
43	Vss	GND
44	BREAK OUT	Break signal output terminal. Outputs break signal to reel motor using H.
45	CAPSTAN STOP	Capstan motor stop terminal. STOP using H.
46	MUTE OUT	Mute output terminal. Mute is accomplished using H.
47	CHANGE HEAD $\overline{F}$/R	Forward/reverse signal switching output terminal. Forward side using L.
48	F, SOL	Forward solenoid drive output (Hold side). Absorbed at L.

- **Reel Motor Control**

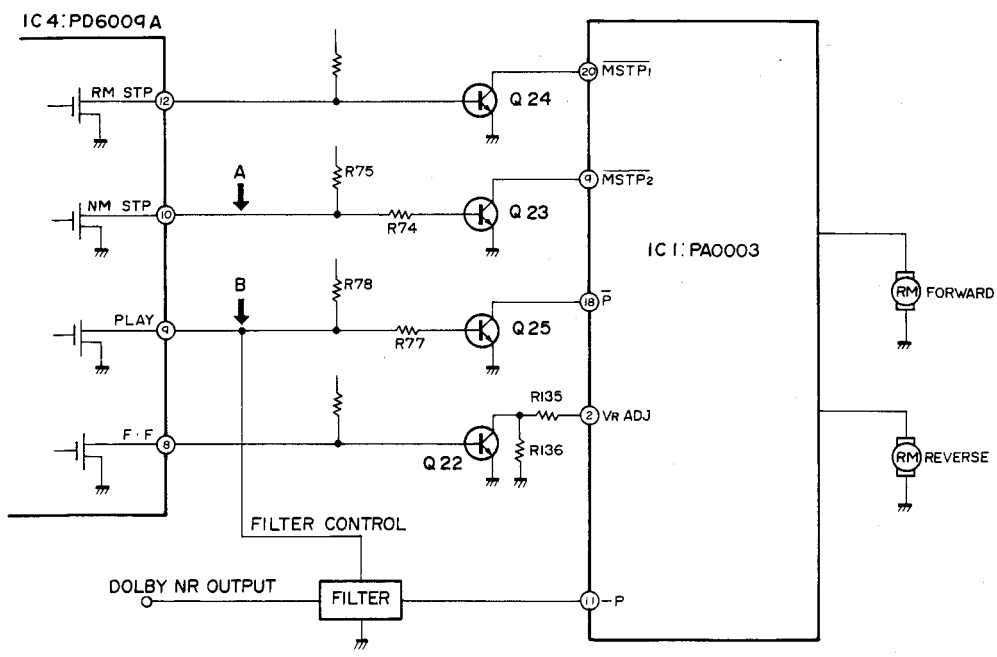


Fig. 4

All reel motor control lines are connected through the inverter using Q22 to Q25. Especially, R74 and R75, which are connected to Q23, are constructed so as to make the electric potential of point A greater than 2V when Q23 is ON due to the internal process of the program. Also, R77 and R78, which are connected to Q25, are constructed so as to make the electric potential of point B 2V when Q25 is ON since the output port of IC 4 (PD6009A) is used for both reel motor control and filter control.

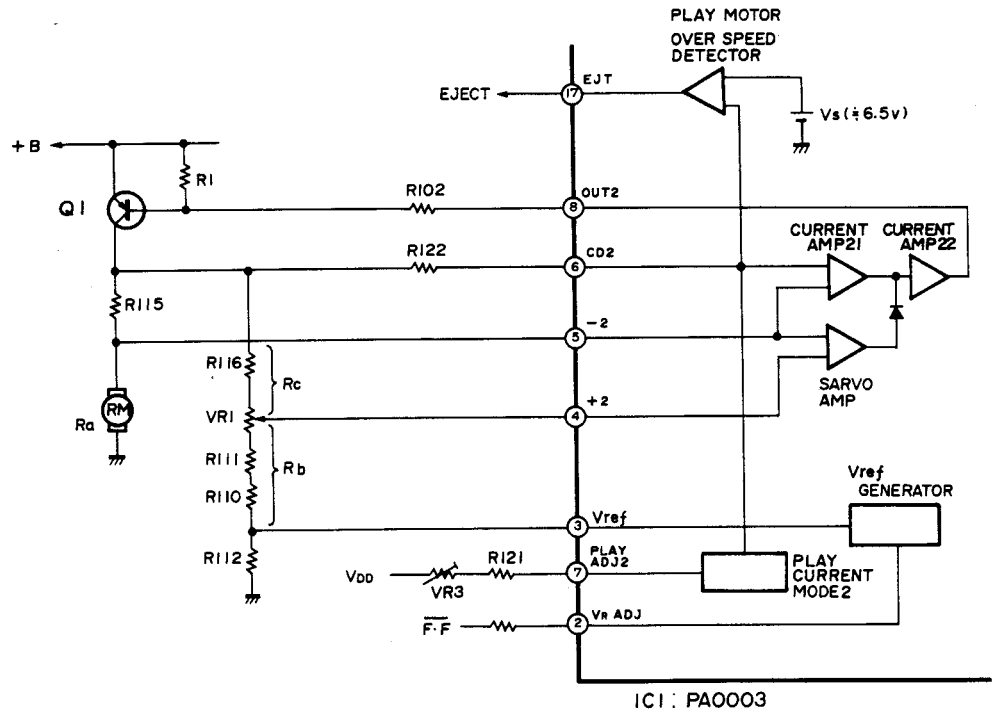


Fig. 5

• PLAY Mode

In the PLAY mode, regulating current is supplied to the motor and fixed torque is generated to the takeup reel. PLAY CURRENT MODE 2 which determines the standard current during PLAY, CURRENT AMP 21 which compares the motor current with the standard current and CURRENT AMP 22 which performs current amplification are provided inside IC1 (PA0003). Standard current flows to standard resistor R122 and a feedback loop is constructed to make the voltage drop of R122 (standard voltage) equal to the voltage drop caused by current flowing at R115 (motor current) so that the motor is driven using a fixed current. Now, if the motor current is low and the voltage drop of R115 is less than the voltage drop of R122, positive current is applied to CURRENT AMP 21 and the output current increases. That current is reversed and amplified using CURRENT AMP 22, thereby increasing the base current of Q1. As a result, the collector current of Q1 increases and also the voltage drop of R115 becomes greater. In this manner, the motor current is stabilized so as to make the voltage drop of R115 and R122 equal.

• F·F/REW Mode and MS Mode

In F·F/REW, a speed regulating servo is used on the motor. Therefore, a certain amount of load gradient is applied and the number of revolutions decreases at a certain rate according to the increase of the motor load. As a result, the tape running speed is regulated irrespective of the size of the take up hub diameter. The speed control of this motor is performed using a bridge servo. For this, the IC incorporates a SERVO AMP which is composed of a differential amp and a CURRENT AMP which increases its output. Also, it incorporates a Vref GENERATOR block to standardize the number of motor revolutions. Connected to the external portion of the IC is a bridge circuit to detect the number of motor revolutions which is constructed with the motor's electronic coil resistor (Ra) as one side. First, fixed electric current is applied to R112 from the Vref GENERATOR and generates standard voltage Vref to the R112 terminal. Also, the bridge determines the value of the resistance so that R115 × Rb = Ra · Rc. Here, if the number of motor revolutions is low and reverse voltage Ea of the motor is lower than standard voltage Vref, positive voltage is input to the SERVO AMP input and the output current of the SERVO AMP increases. That current is reversed and amplified using CURRENT AMP 22 and increases the base current of Q1. Therefore, the collector current increases and the motor accelerates. As a result, reverse voltage Ea of the motor increases as the number of motor revolutions increase. As a result, the motor eventually maintaines a certain number of revolutions so that Ea ≒ Vref. Then, with the above, even though the motor load increases, the number of revolutions do not decrease. Therefore, the bridge becomes unbalanced and a difference in the detection voltage of the bridge is generated as the motor current increases (load increase) as a result of R115 × Rb < Ra · Rc. In other words, as the load increases, the reverse voltage Ea of the motor tends to increase and the number of motor revolutions can be

reduced. In the MS mode, the tape speed is approximately half of that during F·F/REW (approximately 20 times the PLAY speed) and music time detection time is adjusted. This switching of the number of revolutions can be performed by varying the standard voltage Vref using the signal from the control unit.

- **Reel Motor Runaway Detection Operation During PLAY (Fig. 5)**

During PLAY, the motor is driven by a fixed current and the number of revolutions are controlled using the tape speed transmitted from the capstan. When the tape is broken, the number of revolutions cannot be controlled and are accelerated by the PLAY torque and increase. Therefore, the reverse voltage of the motor and terminal voltage increases and approaches the supply voltage of the circuit. This motor voltage is detected using the PLAY MOTOR OVER SPEED DETECTOR block and outputs a signal to the EJT terminal when the motor voltage becomes greater than the standard voltage Vs (≒ 6.5V) and the cassette is ejected.

- **Reel Unit Stop Detector Operation (Fig. 6)**

When tape termination is detected, this is used for detection of completion of ATSC (tape slack takeup), and to determine that both motors have stopped. It is composed of the END SENSE AMP of the differential high gain and the Schmidt circuit block. The nonreversed input of the END SENSE AMP is fixed to the standard voltage inside the IC and reverse input is extracted. As for the motor, power is always ON in each mode. When the motor is revolving, the voltage of the motor terminal is synchronized with the switching of the brushes and commutator and changes. Also, when the motor is in a stopped condition, a certain voltage is reached and is not changed. Therefore, termination detection is possible by detecting this voltage change. Furthermore, the AC of the motor voltage is amplified using the END SENSE AMP and when the output becomes greater than the hysteresis width of the Schmidt circuit, the Schmidt circuit operates and the Schmidt circuit outputs pulses which have been synchronized with the variation in the motor terminal voltage. This output is connected to IC4 and it is interpreted so that when pulses are generated, the motor revolves and when the pulses stop, the motor stops.

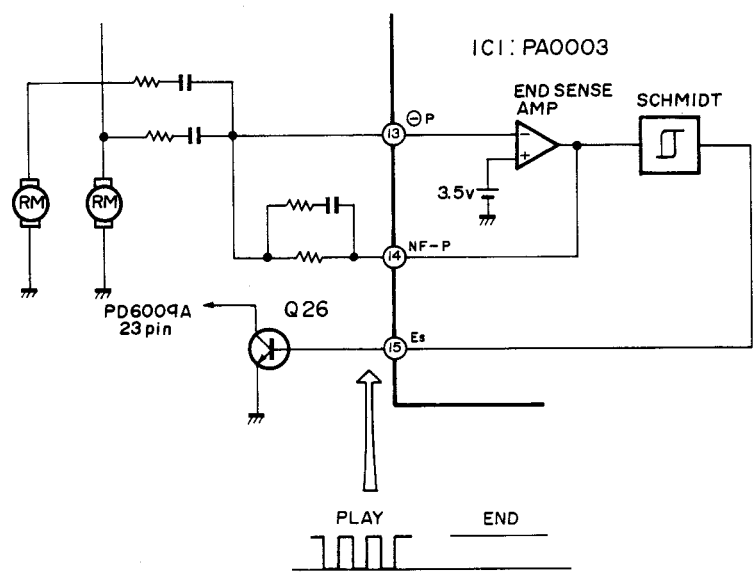


Fig. 6

- **MS Operation**

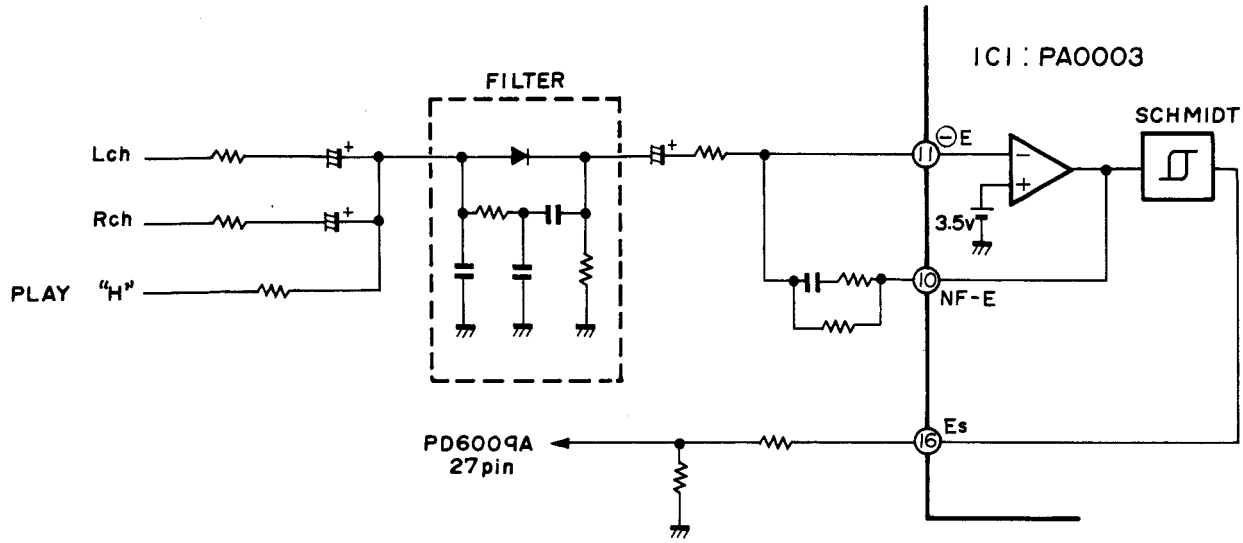


Fig. 7

This detects the unrecorded portions of the tape. Circuit construction is about the same as the reel unit stop detector section. It is combined with the LR output signal of the Dolby NR circuit and, after going through the filter circuit, is input to pin 11 of IC1. It is synchronized with the music recorded on the tape which is above a certain level and pulses are output to the output of the Schmidt circuit. IC4 determines the presence or absence of this pulse train and the music search operation is performed.

- **Capstan Motor Control**

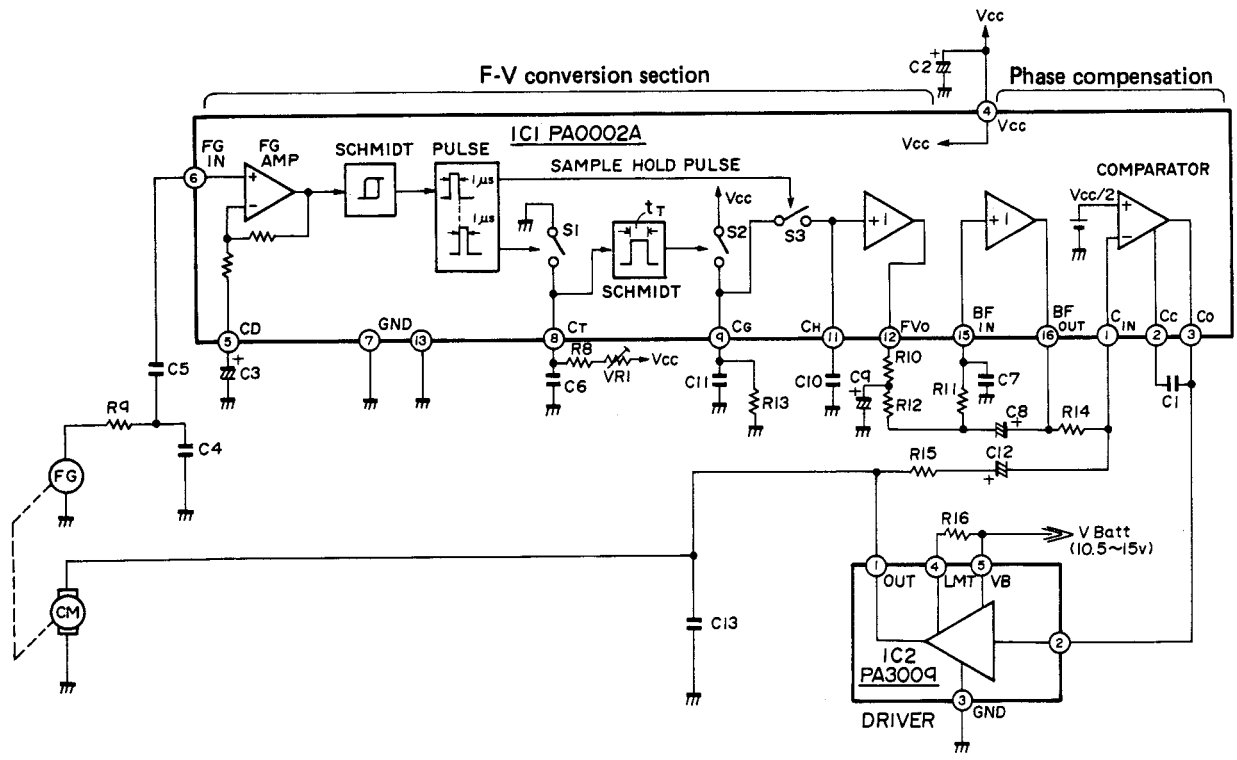


Fig. 8

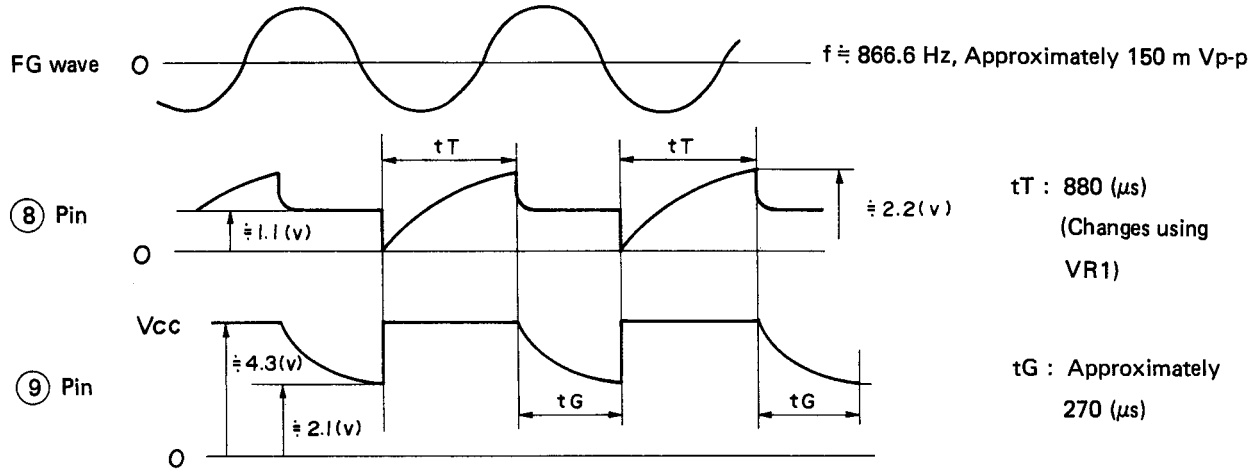


Fig. 9

The signal from the FG (Frequency Generator) of the motor is amplified using the FG AMP and supplies the Schmidt circuit of the wave forming section. It is made into complete pulses using the Schmidt circuit, and the first pulse is made using that drop, and the second pulse is made using the drop of the first pulse. The first pulse is for turning ON sample hold switch (S3), the second pulse is to turn ON discharge switch (S1) of the circuit which makes a certain time by using the charge/discharge circuit in order to increase F-V sensitivity. The second pulse is applied to the charge/discharge circuit of the last stage and turns S1 ON/OFF. The C_T terminal is charged using the time constant of C6 and R8 + VR1 and if the threshhold voltage of the Schmidt circuit is exceeded, the Schmidt circuit reverses. Also, if S1 is On, the load of C6 is discharged momentarily and the Schmidt circuit reverses. In this manner, by turning S1 ON/OFF the Schmidt circuit which is connected to this charge/discharge circuit, makes a pulse of a certain duration and, at this time only, the next S2 comes ON. If S2 is ON, C11 is charged momentarily to Vcc. Also, if S2 goes OFF, the load of C11 is charged using the time constant of C11 and R13. Since the first pulse turns S3 ON during discharge, the voltage information of the C_G terminal at that time is transferred to C10. Immediately following that, S3 goes OFF, S1 comes ON and S2 comes ON in that sequence and C11 is immediately charged to Vcc and the same operation is repeated. If the motor revolves quickly, the widths of the first and second pulses do not change, however, the pulse frequency of the Schmidt circuit ouput increases. In other words, since the duration of the first and second pulses is shortened, the period when S2 goes OFF is shortened. That is to say, the period that C11 is discharging is shortened, and in proportion, high voltage is transferred to C10. From the C_H terminal to the motor terminal, since the characteristics are negative, if the voltage of C10 increases, the motor is operated at a slower speed and the speed is controlled. For the last stage, from the C_H terminal, to prevent discharge of C10, after passing through the high input impedence buffer section, and after passing through one stage of the buffer section, it goes to the comparator amp. The comparator section, using $\frac{Vcc}{2}$ as standard voltage, is compared with the reverse input voltage and operates to control motor speed using the voltage rise/drop. If the reverse input voltage is higher than the standard voltage, negative voltage is applied, which decreases the comparator output current and the motor speed decreases. As a result, if the amount of discharge of C10 (comparator reverse input) is 0, since the motor tries to revolve at the highest speed, a special purpose circuit is not required when applying voltage. During fixed speed running, the amount of charge of C10 becomes approximately $\frac{Vcc}{2}$. The adjustment of the number of revolutions is performed using VR1. If the resistance gets low, since the charge time constant of C6 gets smaller, the period that S2 is ON gets shorter (the period that S2 is OFF gets longer) and the charge voltage to C10 gets lower. As a result, the motor speed increases.

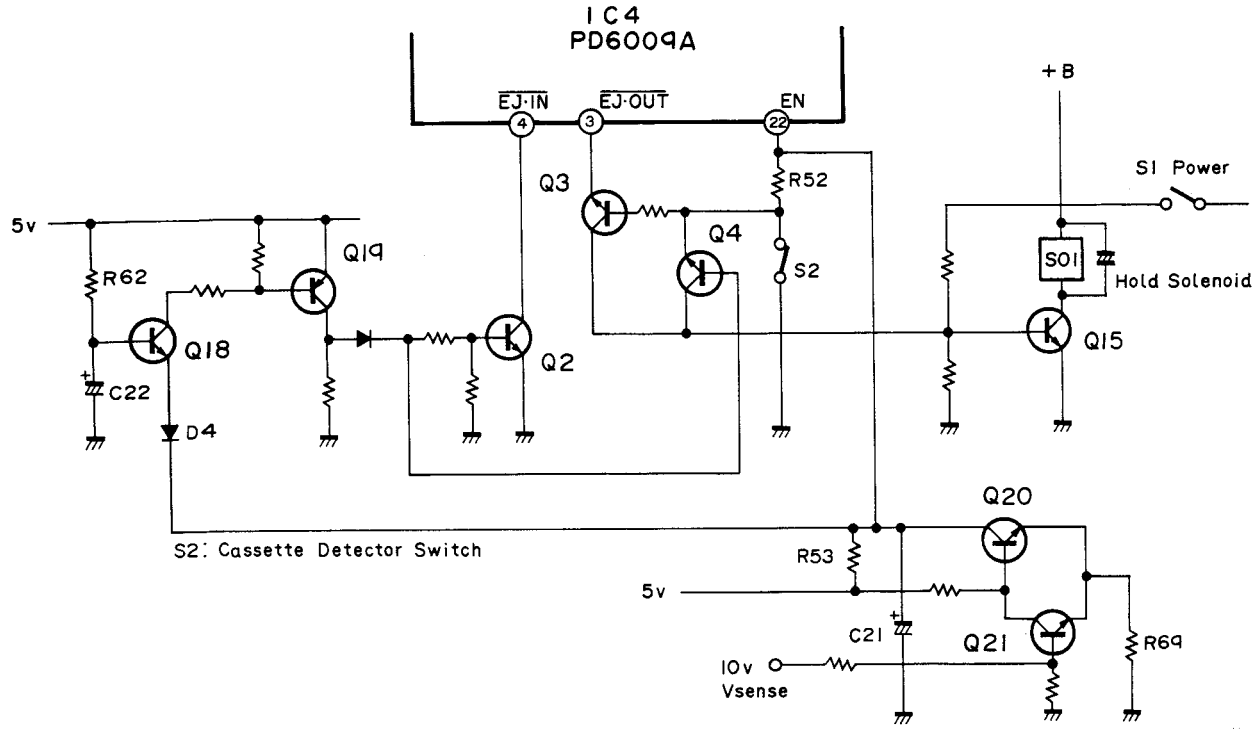


Fig. 10

• Cassette Error Prevention Circuit (Fig. 10)

When a cassette is inserted but is not completely set, this circuit ejects the cassette automatically. For normal operation, first, if a cassette is inserted, S1 comes ON and SO1 (cassette hold solenoid) is pulled using Q15 ON. Also Vcc of IC4 also comes ON but, since EN (pin 22) is grounded via R52 using S2, it does not rise and IC4 does not go to an active condition. Also, since Q3 is OFF, the $\overline{EJ}$ signal of IC4 is arrested. Next, if the cassette is completely set, S2 goes OFF and EN rises and IC4 goes to an active condition. Also, Q3 also comes ON so that Q15 can receive the $\overline{EJ}$ signal. When the cassette is not completely set (while S2 is ON), EN comes ON, Q3 goes OFF and Q15 comes ON. Then, C22 is charged using the time constant of R62 and C22 and eventually, Q18 comes ON. Next, Q19 an Q4 come ON, Q15 goes OFF, SO1 is released and the cassette is ejected.

• Eject Circuit When Power Supply Voltage Gets Abnormally Low (Fig. 10)

If the potential of Vsense gets lower than 6.4V, the Schmidt circuit operates using Q21 and Q20 and IC4 is reset and goes to a first stage condition. At the same time, Q18, Q19, and Q4 come ON in sequence, SO1 is released and the cassette is ejected.

• Initial Reset Circuit (Fig. 10)

When power is supplied, this circuit prevents misoperation of IC4 as a result of pulses generated in the power supply line or unstable elements. EN is held at a low level for a certain period after power is supplied and the operation of IC4 is stopped. Load the cassette and if S2 goes OFF, EN becomes H level after the period determined using R53 and C21 and IC4 goes to an active condition.

- **End.s Misoperation Prevention Circuit**

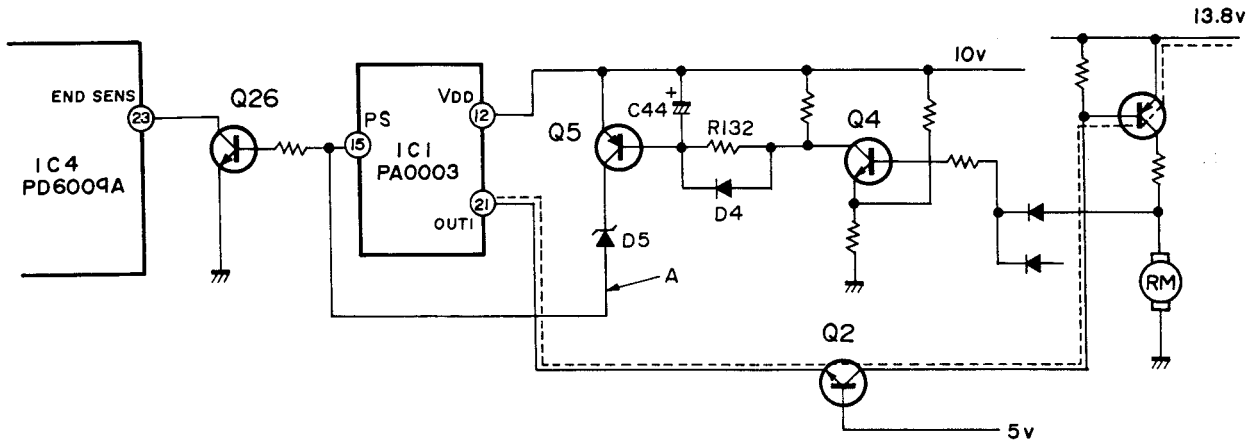


Fig. 11

If the power supply contains ripple elements when voltage is decreased, ripple is also present in the 10V power supply line of Figure 11 and when the tape ends in the F·F/REW condition, voltage of the motor terminal varies using the ripple, and, as a result, the ES terminal voltage of IC1 also varies and a normal end signal is not sent to END SENSE of IC4 and the tape end condition continues as is. This circuit prevents this. Under normal conditions, the voltage of the motor terminal is 4.2V and Q4 does not come ON. If the tape ends, the motor terminal voltage becomes approximately 8V and Q4 comes ON. The base voltage of Q5 gets lower using the time constant of C44 and R132 and eventually Q5 comes ON. Then the voltage at point A becomes 10V − 7.4V ≒ 2.6V. Therefore, even if the ES terminal voltage of IC1 varies using ripple, by applying direct current bias using the main circuit, Q26 comes ON and the end signal can be sent to the END SENSE terminal of IC4. Also, during PLAY, strong NF is accomplished inside IC1 and since the motor terminal voltage is held low (approximately 4V), a poor condition does not exist even when the 10V line varies at the reduced voltage. However, if there is no Q2, when the 13.8V line varies, a ripple element goes into the IC taking a route as shown by the broken line and causes influence therein and causes the ES terminal voltage to vary. Then Q2 is added and if the 5V line is taken as a base voltage, it becomes a kind of base ground operation and since the emitter of Q2 is pulled using IC1 at nearly fixed current, the ripple element contained in the collector line of Q2 does not come out to the emitter side of Q2.

5. MECHANISM DESCRIPTION

⇨ : Shows direction to be moved

➡ : Shows direction already moved

• Cassette Load Mechanism

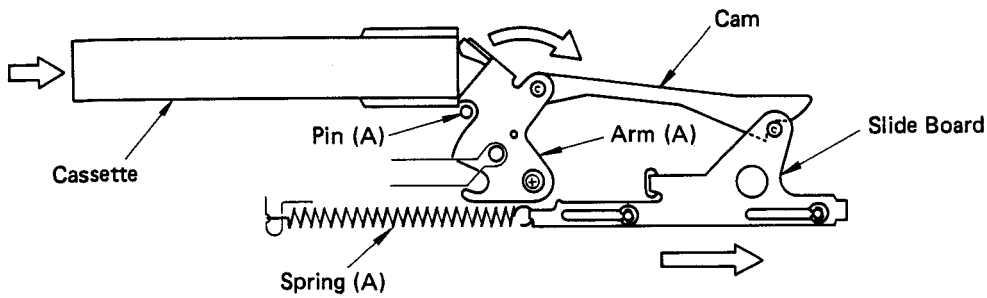
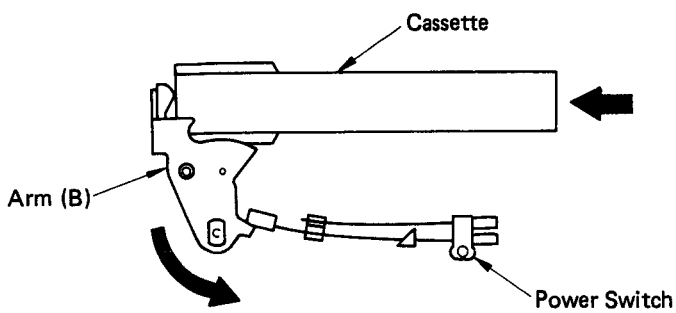


Fig. 12

1. If a cassette is inserted, Arm (A) moves in the direction shown by the arrow. The Slide Board is pushed by the Cam and moved in the direction of the arrow. Pin (A) is the Cassette Holder Arm pin. (Fig. 12)



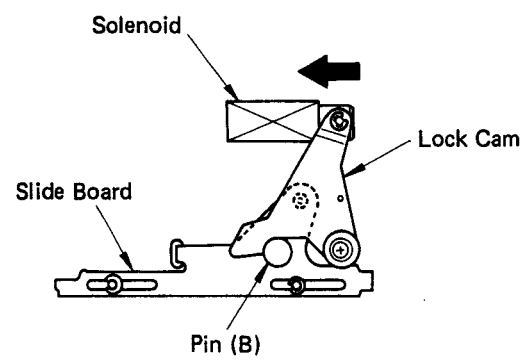


Fig. 13

2. Arm (A) and Arm (B) are connected by a shaft. While the cassette is being inserted, Arm (B) turns the Power Switch ON. If the Power Switch comes ON, the Solenoid is pulled and the Slide Board is locked by the Lock Cam. (Fig. 13)
3. When the cassette is pushed all the way in, pin (A), which is supported by Arm (A), moves in the direction of the arrow using Spring (B), etc., and the Cassette Holder Arm goes down and the cassette is loaded. (Fig. 14)

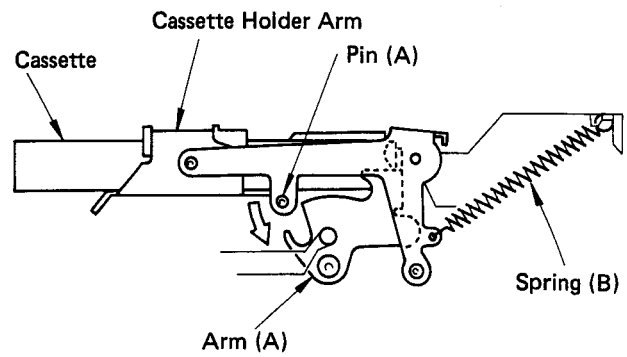


Fig. 14

• Eject Mechanism

1. Figure 15 shows the cassette loaded condition. If the EJECT button is pressed, the Solenoid goes OFF and the Lock Cam moves in the direction of the arrow and the Slide Board lock is unlocked. The unlocked Slide Board moves in the direction of the arrow and lifts the Cassette Holder Arm. If the cassette holder moves up, Arms (A) and (B) eject the cassette using Spring (C).

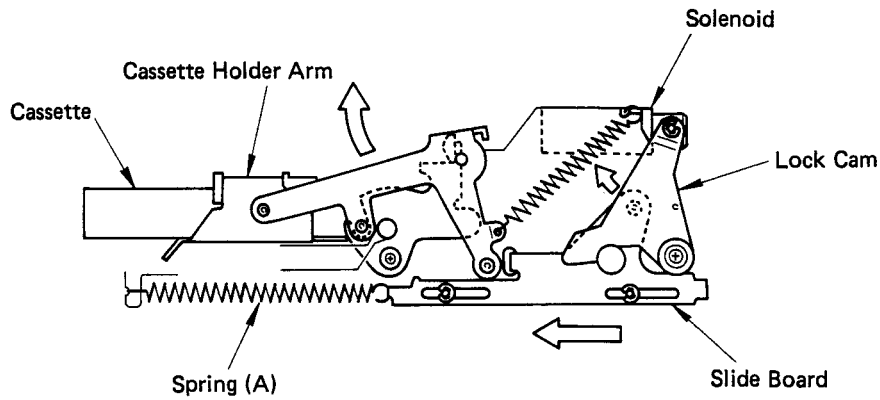


Fig. 15

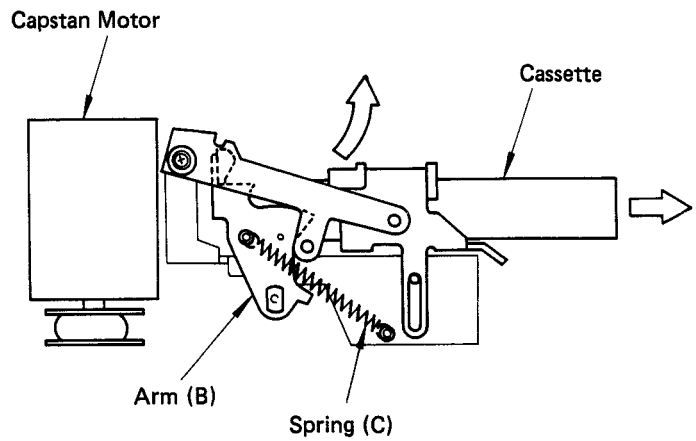
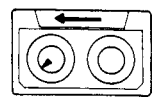
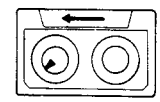
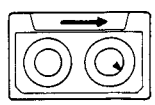
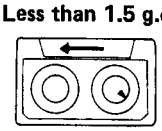


Fig. 16

6. ADJUSTMENT

6.1 CHECK POINTS OF CASSETTE MECHANISM

Confirm the following items when replacing parts of the cassette mechanism.	■ Tape speed deviation: 3,030 ± 60Hz (4.76 cm/s $^{+3\%}_{-1\%}$) Using an STD-301A, measure the speed at the start and end of winding and take the maximum value. Measureing time shall be 5 ~ 6 seconds.	■ Wow and flutter: Less than 0.25% (RMS) Less than 0.12% (WRMS) Using an STD-301A, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5 ~ 6 seconds.
■ Fast forward and rewinding time: **Less than 120 seconds** Using an C-60, set to fast forward and rewind, and measure the time with a stop watch.	■ Winding torque: **35 ~ 45 g.cm**  Using a cassette type torque meter (120 g.cm), measure the minimum value while in the play mode. Measuring time shall be 5 ~ 6 seconds.	■ F.F torque: **More than 70g.cm**  Using a cassette type torque meter (160 g.cm), measure the value when the tope stops in the F.F. mode.
■ REW torque: **More than 70g.cm**  Using a cassette type torque meter (160 g.cm), measure the value when the tape stops in the REW mode.	■ Back tension torque: **Less than 1.5 g.cm**  After setting in the REW mode wihtout loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.	■ Pinch roller pressure: **220 ~ 280g** Measure the pressure with a tension meter (1 kg) at the point where the rotor stops rotating at the center of the pinch roller.
■ Cassette loading force: **Less than 1,200g**	■ Clearance between flywheel and flywheel bracket: **0.05 ~ 0.15 mm**	

6.2 AZIMUTH ADJUSTMENT

- **To Adjust**

1. Playback STD-341A (10kHz, −20dB) and adjust the azimuth to obtain maximum output for both forward and reverse directions.
2. If the difference between forward and reverse is great, adjust to the midpoint of both directions.
3. After adjustment, lock in position using tightening screw (GYL-001).

6.3 DOLBY NR LEVEL ADJUSTMENT

- **Connection Diagram**

Switch positions

Tape selector . . . . . OFF
Dolby NR . . . . . OFF

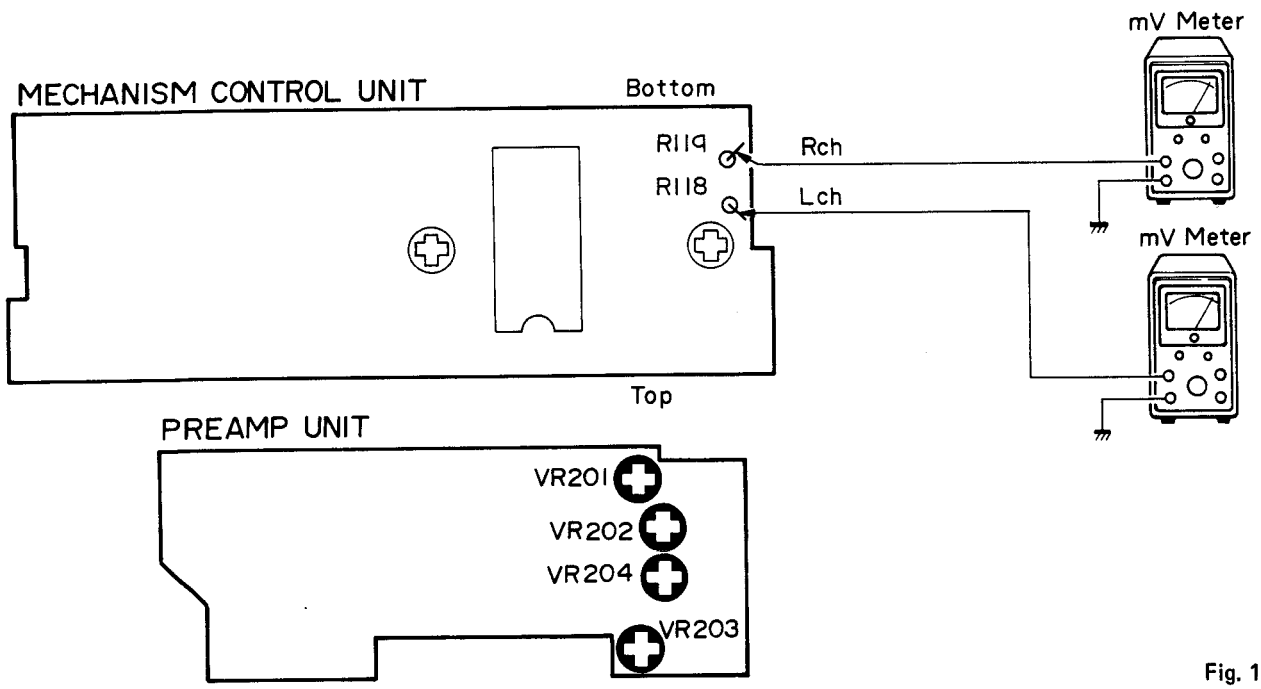


Fig. 17

- **To Adjust**

1. Playback CT-150 (400 Hz, 200 nwb/m) and adjust the next semifixed resistance so that the mV meter shows 775 mV (0dBs). Provided that the adjustment accuracy is ± 1dBs.
   Forward Lch: VR201, Rch: VR202
   Reverse Lch : VR203, Rch: VR204

6.4 DOLBY NR LAW ADJUSTMENT

• Connection Diagram

Switch position

Tape selector . . . . . OFF

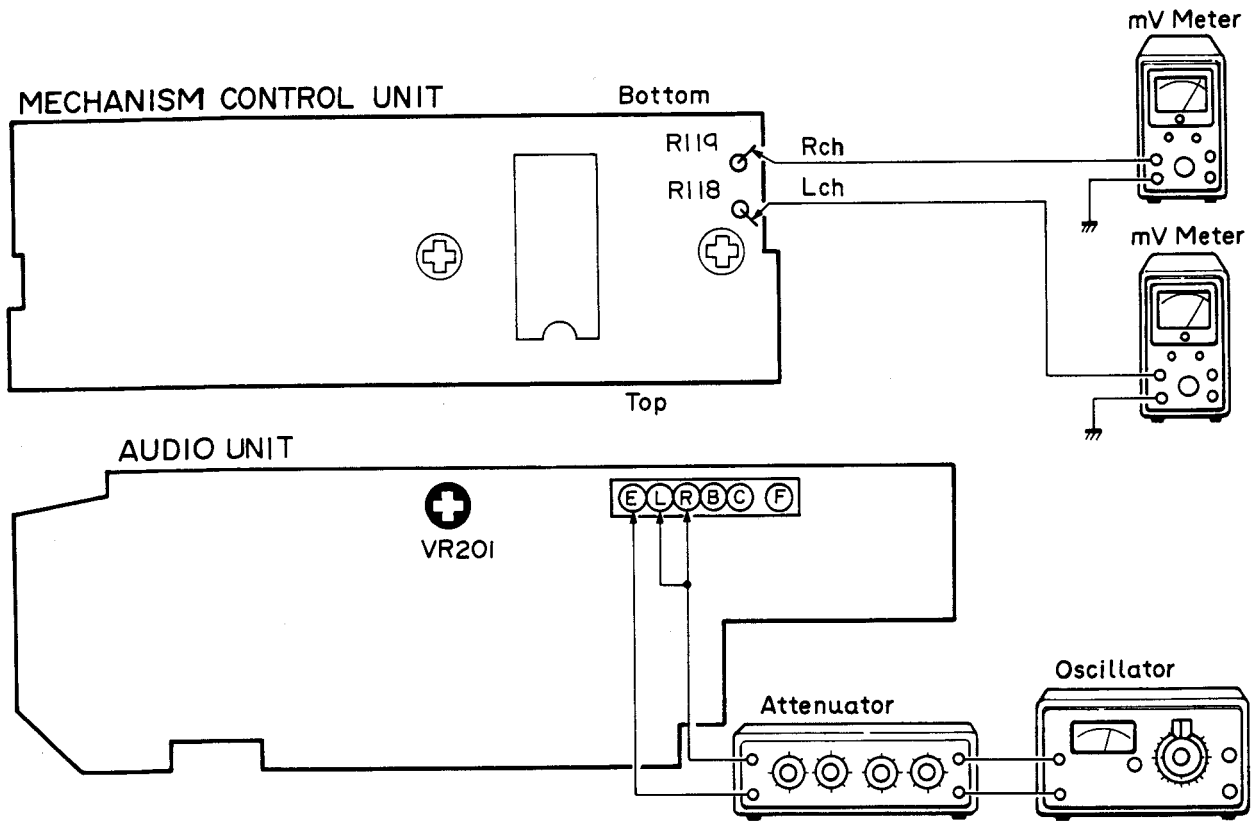


Fig. 18

• To Adjust

1. Turn the Dolby NR switch OFF.
2. Apply a 5 kHz signal to the audio unit and adjust the attenuator so that the mV meter shows 58.7 mV (−22.4dBs).
3. Turn the Dolby NR switch ON and adjust VR201 so that the mV meter shows 23.4 mV (−30.4dBs).

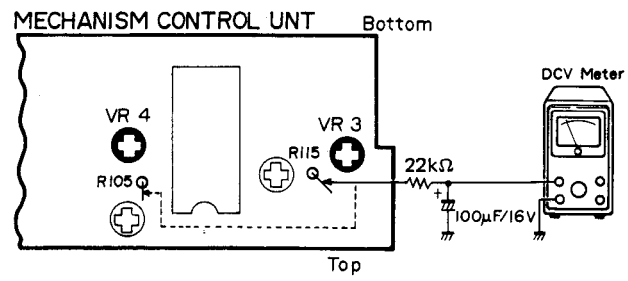
6.5 PLAY TORQUE ADJUSTMENT

• Connection Diagram

Switch positions

Tape selector . . . . . OFF

Dolby NR . . . . . OFF



- **To Adjust**

1. Playback cassette tape (C-60, etc.) and adjust VR3 for forward and VR4 for reverse so that the DCV meter shows 4.0V ± 0.2V.
2. Using a cassette type torque meter (120g.cm), confirm that forward and reverse torque are 35g.cm to 44g.cm.

6.6 TAPE SPEED ADJUSTMENT

- **Connection Diagram**

Switch positions

Tape selector . . . . . OFF
Dolby NR . . . . . OFF

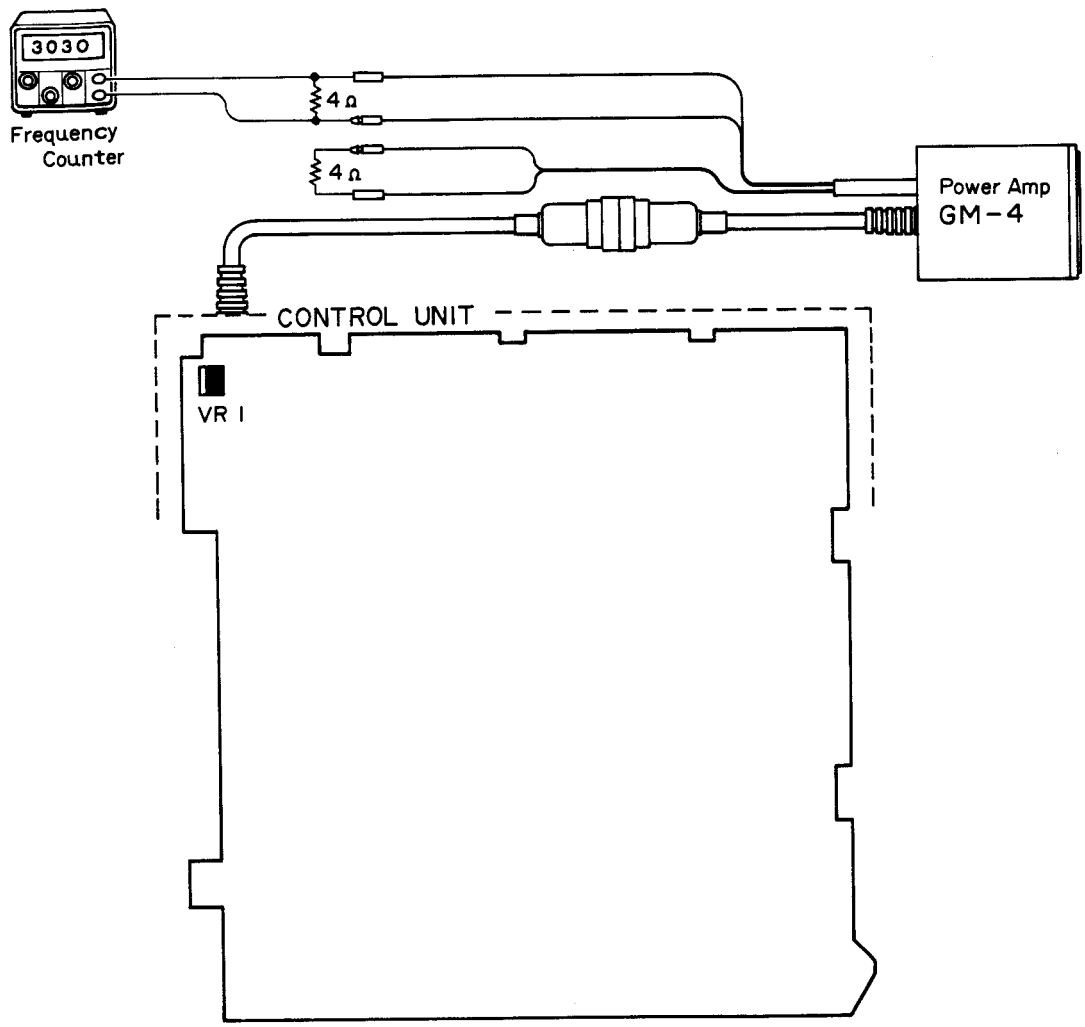


Fig. 20

- **To Adjust**

1. Playback STD-301 (3 kHz, −10dB) and adjust VR1 so that the frequency counter shows 3,030 kHz ± 60kHz.

6.7 SERVO GAIN ADJUSTMENT

- **Connection Diagram**

Switch positions

Tape selector . . . . . OFF
Dolby NR . . . . . OFF

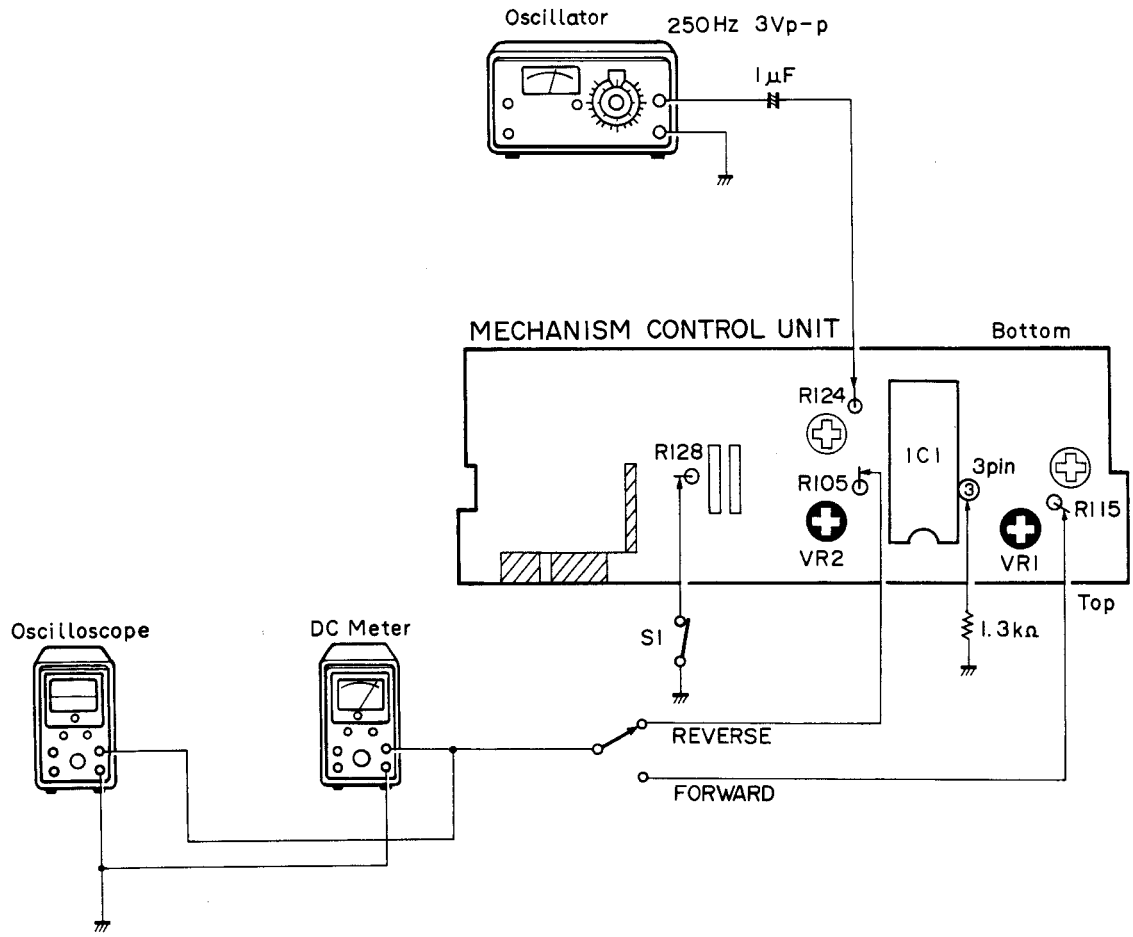


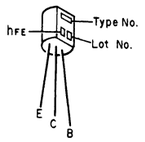
Fig. 21

- **To Adjust**

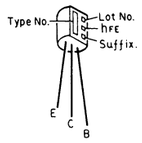
1. Input a 250 kHz, 3 Vp-p signal from the oscillator.
2. Playback cassette tape (C-60, etc.) using the PLAY mode. Adjust VR1 for forward and VR2 for reverse so that the DC meter shows 4.3 ± 0.2V.
   Note: Adjustments should be performed within ATSC time (when taking up tape slack). Tape ejects in approximately 10 seconds so reinsert the tape and operate. Adjustments should be made quickly since the voltage goes down slowly if it takes time to insert the tape.
3. Turn S1 OFF and confirm tape forward and reverse movement.

• IC's and Transistors

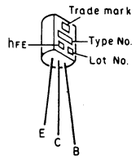
2SC1740
2AC1740LN



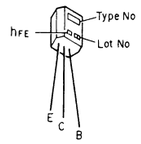
2SA733



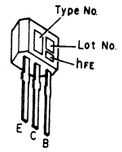
2SC828
2SC2634



2SA1048
2SC2458

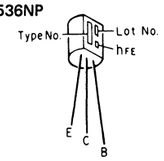


2SC536SP

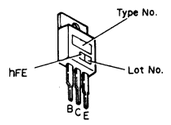


2SA608NP
2SA608KNP
2SA950
2SA1015
2SC536NP

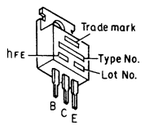
2SC945
2SC1815
2SC2001
2SD734



2SB507
2SD313
2SD1061



2SB596
2SB762



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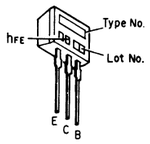
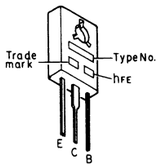
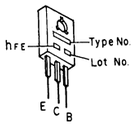
2SA1175



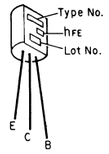
2SA715



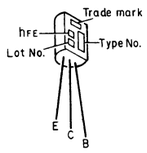
2SB632
2SB632K



2SD468



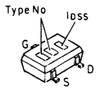
2SC1383



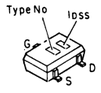
Chip Transistors

Part No.	Indication (Type No., hFE, IDSS)
2SK198-1OP	1OP
2SK198-1OQ	1OQ
2SK209-XG	XG
2SK209-XY	XY
2SB709-AO	AO
2SB709-AP	AP
2SB709-AQ	AQ
2SB709-AR	AR
2SB709-AS	AS
2SA1162-SY	SY
2SA1162-SG	SG
2SA1179-M5	M5
2SA1179-M6	M6
2SA1179-M7	M7
2SD601-YO	YO
2SD601-YP	YP
2SD601-YQ	YQ
2SD601-YR	YR
2SD601-YS	YS
2SC2712-LY	LY
2SC2712-LG	LG
2SC2712-LL	LL
2SC2812-L5	L5
2SC2812-L6	L6
2SC2812-L7	L7

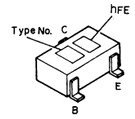
2SK198



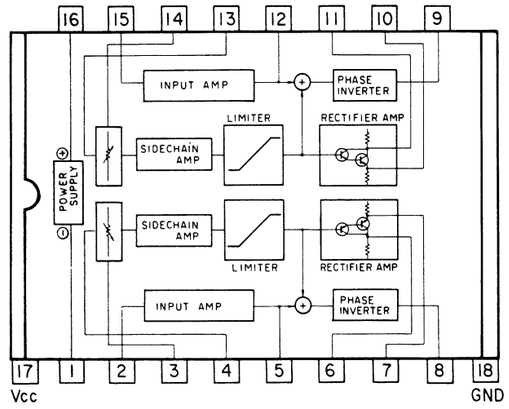
2SK209



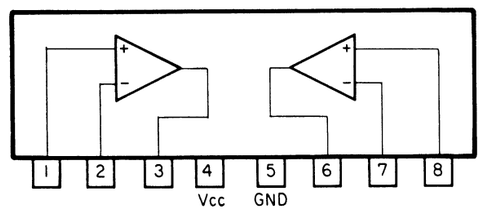
2SB709 **2SC2712**
2SA1162 **2SC2812**
2SA1179 **2SD601**



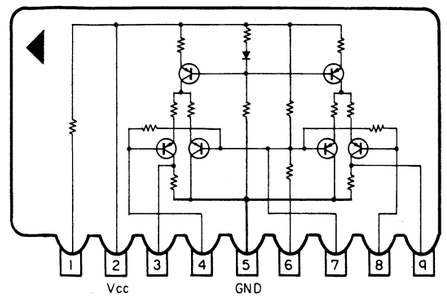
HA11226



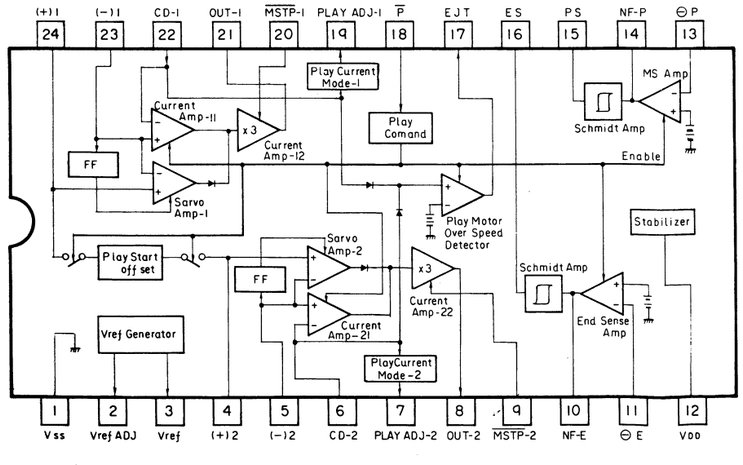
MB3106MF



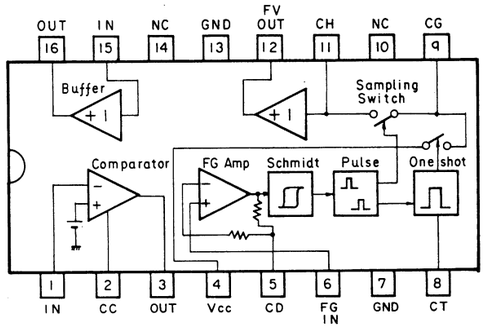
KHA102



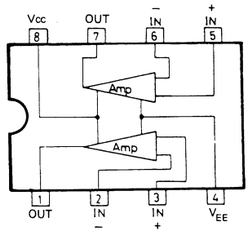
PA0003



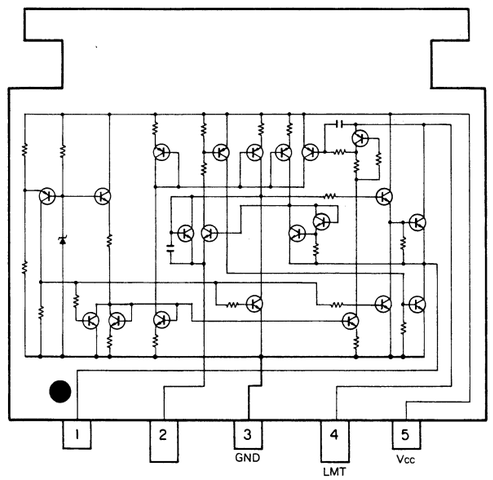
PA0002A



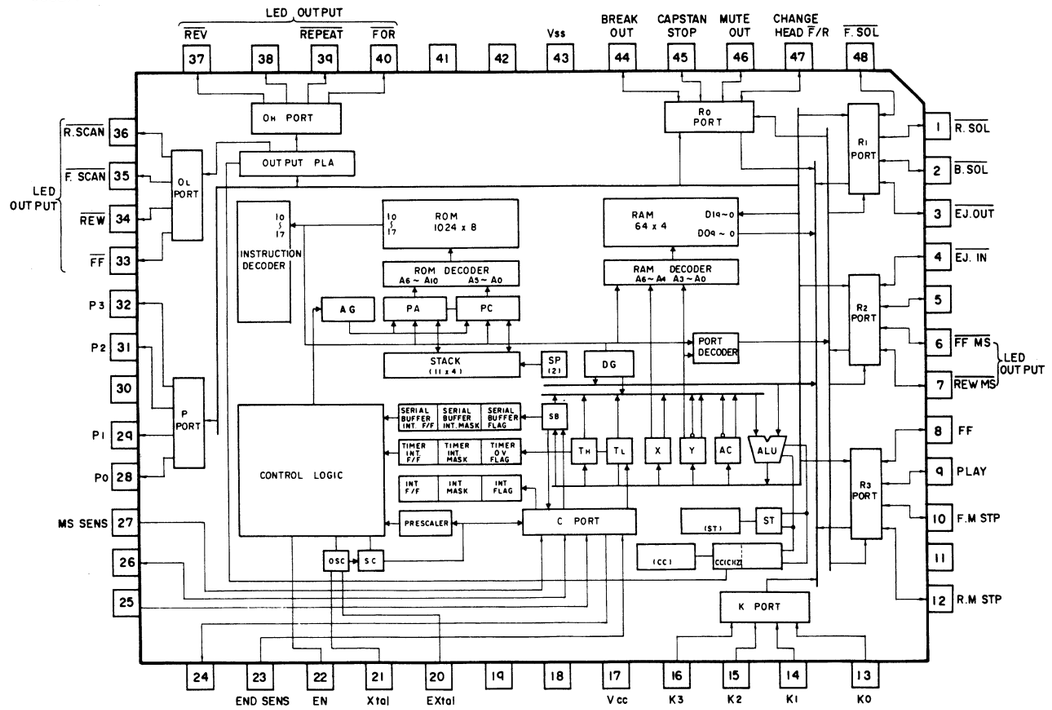
TA75558P



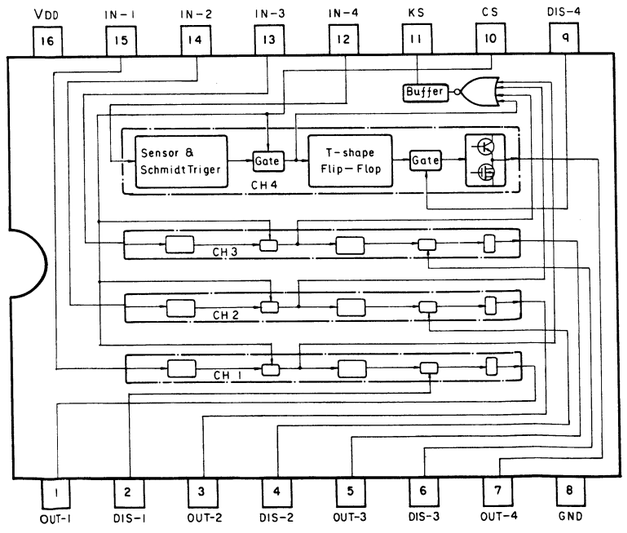
PA3009



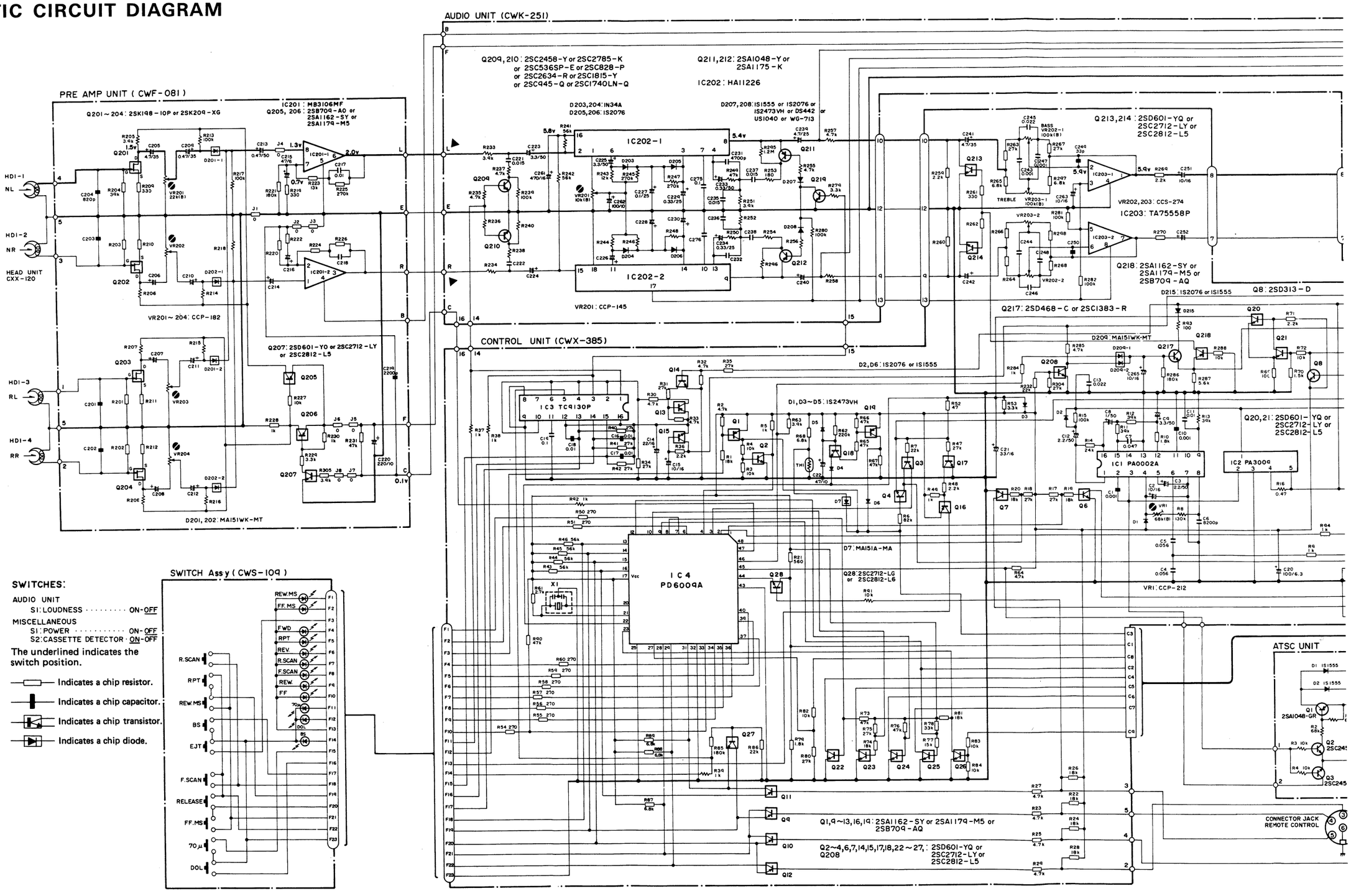
PD6009A



TC9130P



7. SCHEMATIC CIRCUIT DIAGRAM



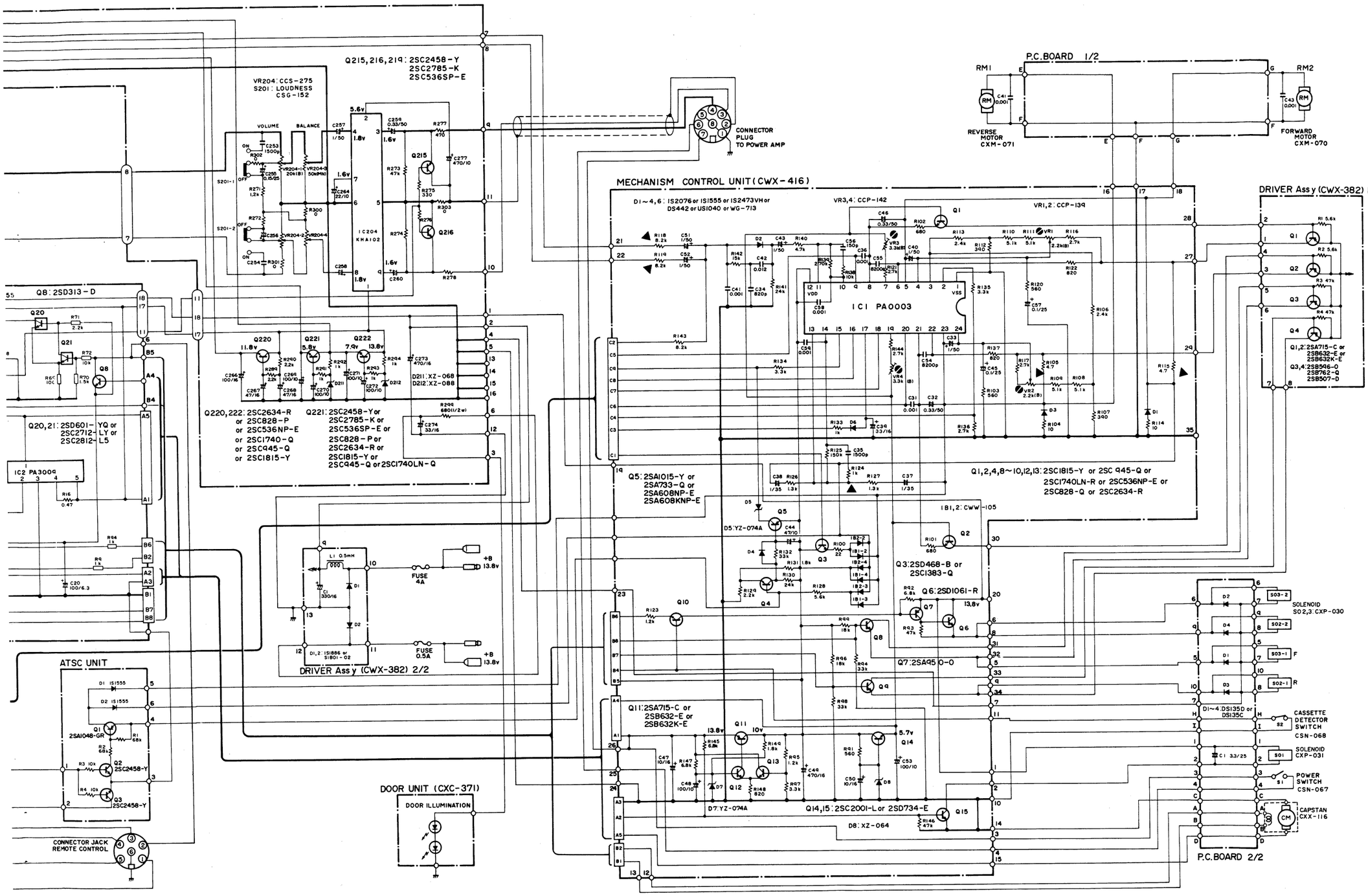
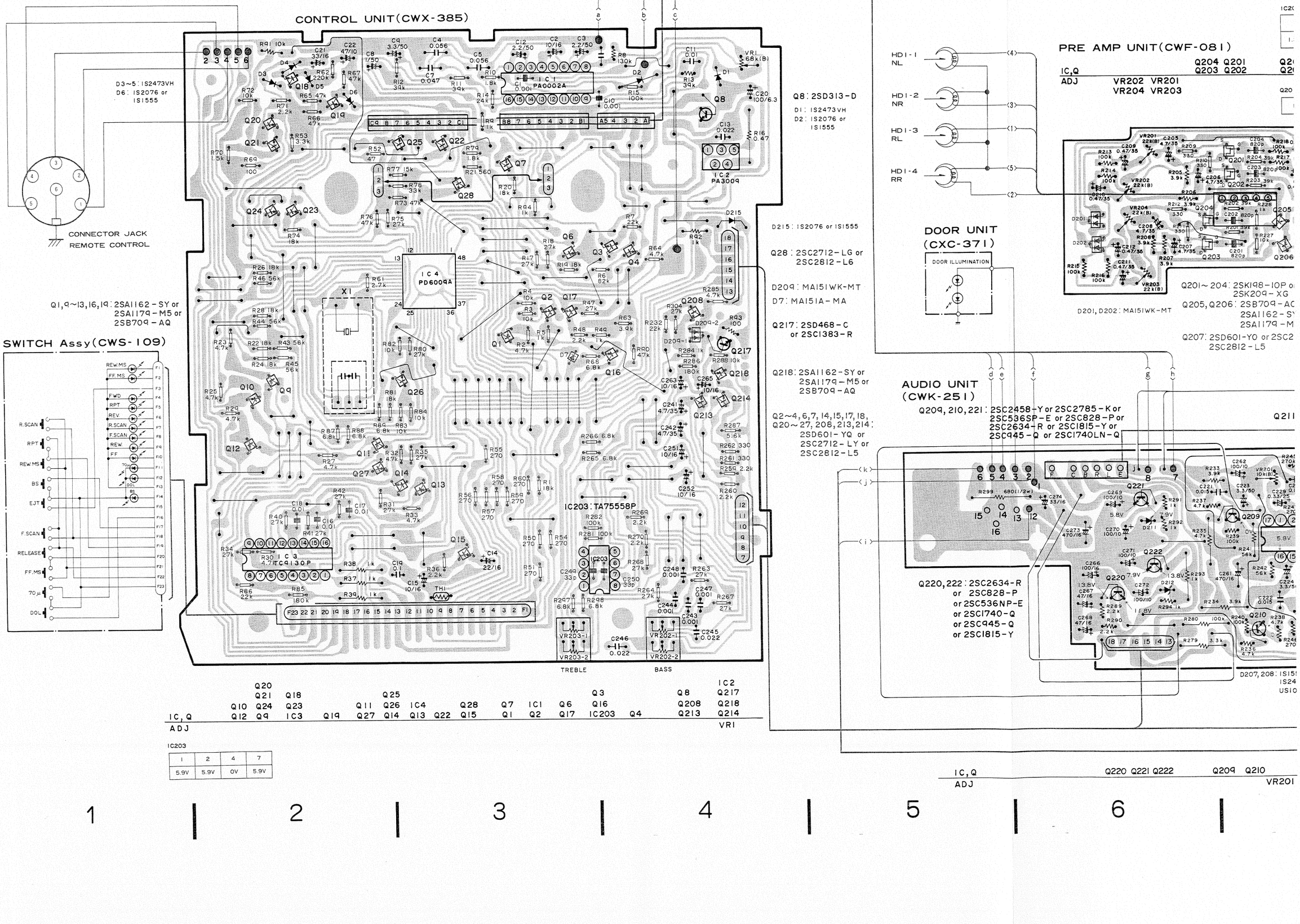

MECHANISM CONTROL UNIT (CWX-416)
P.C.BOARD 1/2
RM1
RM2
REVERSE MOTOR CXM-071
FORWARD MOTOR CXM-070
CONNECTOR PLUG TO POWER AMP
DRIVER Ass'y (CWX-382) 1/2
D1~4,6: IS2076 or IS1555 or IS2473VH or DS442 or US1040 or WG-713
VR3,4: CCP-142
VR1,2: CCP-139
IC1 PA0003
Q1,2,4,8~10,12,13: 2SC1815-Y or 2SC945-Q or 2SC1740LN-R or 2SC536NP-E or 2SC828-Q or 2SC2634-R
Q5: 2SA1015-Y or 2SA733-Q or 2SA608NP-E 2SA608KNP-E
Q3: 2SD468-B or 2SC1383-Q
Q6: 2SD1061-R
Q7: 2SA950-O
Q11: 2SA715-C or 2SB632-E or 2SB632K-E
Q14,15: 2SC2001-L or 2SD734-E
D5: YZ-074A
D7: YZ-074A
D8: XZ-064
IB1,2: CWW-105
Q1,2: 2SA715-C or 2SB632-E or 2SB632K-E
Q3,4: 2SB546-Q 2SB762-Q 2SB507-D
Q215,216,219: 2SC2458-Y 2SC2785-K 2SC536SP-E
VR204: CCS-275
S201: LOUDNESS CSG-152
VOLUME
BALANCE
IC204 KHA102
Q8: 2SD313-D
Q20,21: 2SD601-YQ or 2SC2712-LY or 2SC2812-L5
Q220,222: 2SC2634-R or 2SC828-P or 2SC536NP-E or 2SC1740-Q or 2SC945-Q or 2SC1815-Y
Q221: 2SC2458-Y or 2SC2785-K or 2SC536SP-E or 2SC828-P or 2SC2634-R or 2SC1815-Y or 2SC945-Q or 2SC1740LN-Q
D211: XZ-068
D212: XZ-088
IC2 PA3006
ATSC UNIT
CONNECTOR JACK REMOTE CONTROL
DOOR UNIT (CXC-371)
DOOR ILLUMINATION
DRIVER Ass'y (CWX-382) 2/2
SOLENOID S02,3: CXP-030
CASSETTE DETECTOR SWITCH CSN-068
SOLENOID CXP-031
POWER SWITCH CSN-067
CAPSTAN CXX-116
P.C.BOARD 2/2

Fig. 22

8. CONNECTION DIAGRAM



IC, Q	Q10 Q12	Q20 Q21 Q24 Q9	Q18 Q23 IC3	Q19	Q11 Q27	Q25 Q26 Q14	IC4 IC3	Q22	Q28 Q15	Q7 Q1	IC1 Q2	Q6 Q17	Q3 Q16 IC203	Q4	Q8 Q208 Q213	IC2 Q217 Q218 Q214
ADJ																VR1

IC203

1	2	4	7
5.9V	5.9V	0V	5.9V

IC, Q	Q220 Q221 Q222	Q209 Q210
ADJ		VR201

7 8 9 10 11 12

A B C D

IC201

1	2	3	4	5	6	7	8
1.3V	0.7V	2.0V	7.9V	0V	2.0V	0.7V	1.3V

F-081)

Q204 Q201
Q203 Q202

Q205
Q206 Q207 IC201

Q201, 202

D	1.5V

201~204: 2SK198-10P or
2SK209-XG

205, Q206: 2SB709-A0 or
2SA1162-SY or
2SA1179-M5

207: 2SD601-Y0 or 2SC2712-LY or
2SC2812-L5

IC201
MB3106MF

ATSC UNIT

D1,2: IS1555 or IS2076

Q1: 2SA1048-GR or
2SA1175-E or
2SA608SP-F

Q2,3: 2SC2458-Y or
2SC2785-J or
2SC536SP-E

MECHANISM
CONTROL UNIT
(CWX-416)

IC,Q ADJ | Q15 | Q14 Q13 | Q12 Q11 | Q10 Q7 | Q9 Q8 Q6 Q4 | Q5 | Q3 | Q2 VR2 VR4 | IC1 VR1 | Q1 VR3

IB1, IB2

D1~4,6: IS2076 or IS1555 or
IS2473VH or DS442 or
USI040 or WG-713

IC1
PA0003

D5,7: YZ-074A
D8: XZ-064

Q5: 2SA1015-Y or 2SA733-Q or
2SA608NP-E or 2SA608KNP-E

Q6: 2SD1061-R

Q7: 2SA950-0

Q3: 2SD468-B or
2SC1383-Q

Q1,2,4,8~10,12,13: 2SC1815-Y or 2SC945-Q or
2SC1740LN-R or 2SC536NP-E or
2SC828-Q or 2SC2634-R

Q11: 2SA715-C or 2SB632-E or
2SB632K-E

Q14,15: 2SC2001-L or 2SD734-E

CONNECTOR PLUG
TO POWER AMP

IC204: KHA102
Q215, 216, 219: 2SC2458-Y
or 2SC2785-K
or 2SC536SP-E

Q211, 212: 2SA1048-Y or
2SA1175-K

IC202
HA11226

IC204

D207, 208: IS1555 or IS2076 or
IS2473 or DS442 or
USI040 or WG-713

D205, 206: IS2076

D203, 204: 1N34A

D211: XZ-068

D212: XZ-088

S2
CASSETTE
DETECTOR
SWITCH

P.C. BOARD

D1~4: DSI35D or DSI35C

S01
SOLENOID

S1
POWER
SWITCH

S03-2 S02-2
S03-1 S02-1
F R
SOLENOID

CM
CAPSTAN

RM1 REVERSE MOTOR
RM2 FORWARD MOTOR

C41 0.001
C43 0.001

DRIVER Assy
(CWX-382)

Q1,2: 2SA715-C or 2SB632-E
or 2SB632K-E

Q3,4: 2SB596-O or 2SB762-Q
or 2SB507-D

D1,2: IS1886 or S1B01-02

+B 13.8V
FUSE 4A

FUSE 0.5A
+B 13.8V

Fig. 23

9. CABINET EXPLODED VIEW

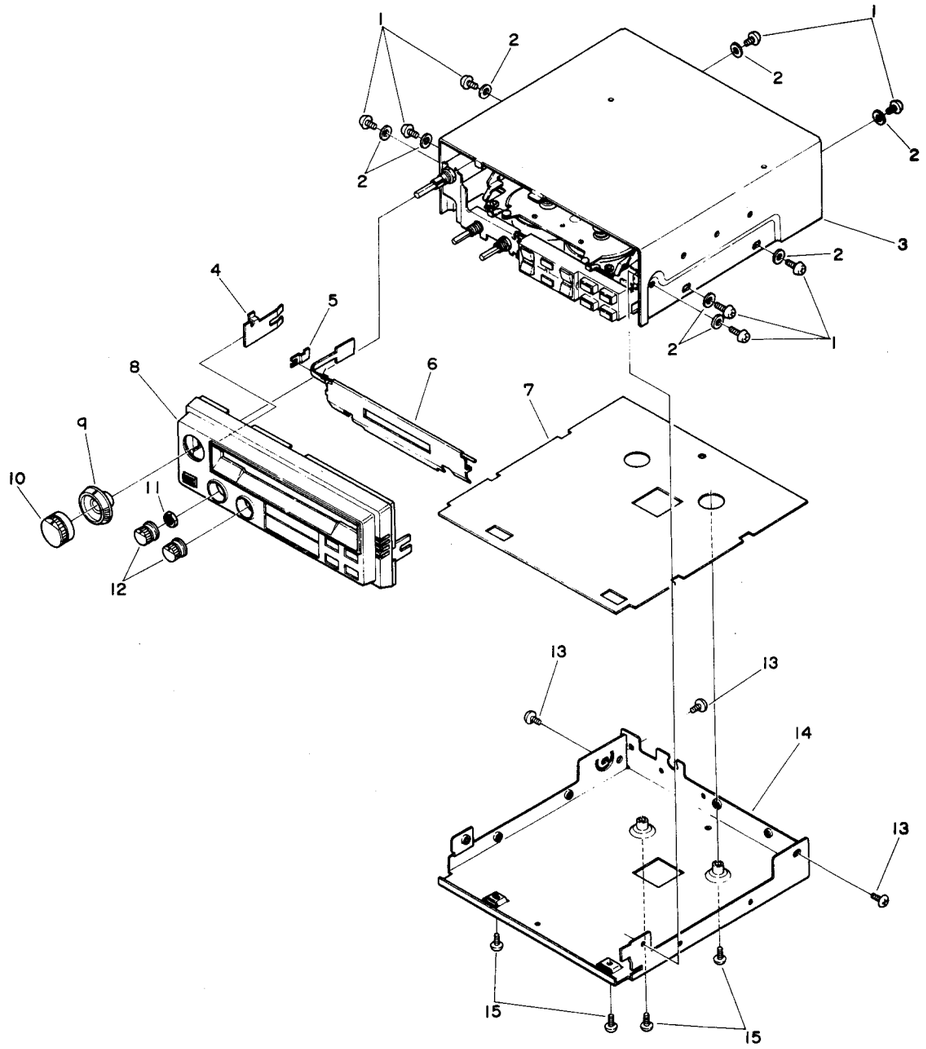
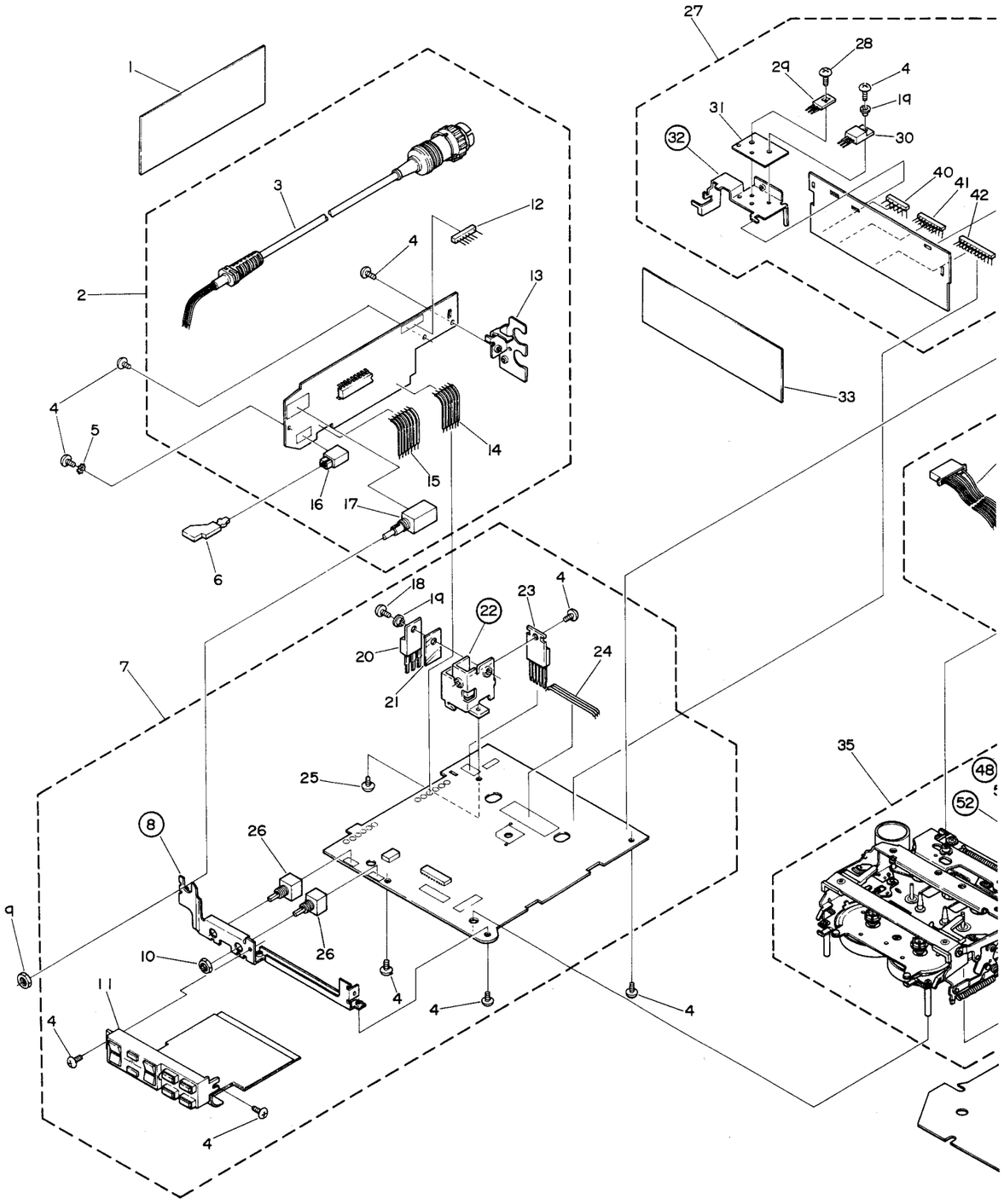


Fig. 24

10. CHASSIS EXPLODED VIEW



• Parts List

Mark	No.	Part No.	Description
	1.	BMZ30P060FBK	Screw
	2.	WA32N060D050	Washer
	3.	CXC-373	Case Unit
	4.	CNF-162	Holder
	5.	CNF-161	Holder
	6.	CXC-371	Door Unit
	7.	CNM-708	Insulator
	8.	CXX-115	Grille Unit
★	9.	CAA-347	Knob (BALANCE)
★	10.	CAA-345	Knob (VOLUME)
	11.	CBA-066	Nut M6
★	12.	CAA-344	Knob (BASS, TREBLE)
	13.	BMZ30P050FMC	Screw
	14.	CXC-372	Chassis Unit
	15.	BMZ26P080FMC	Screw

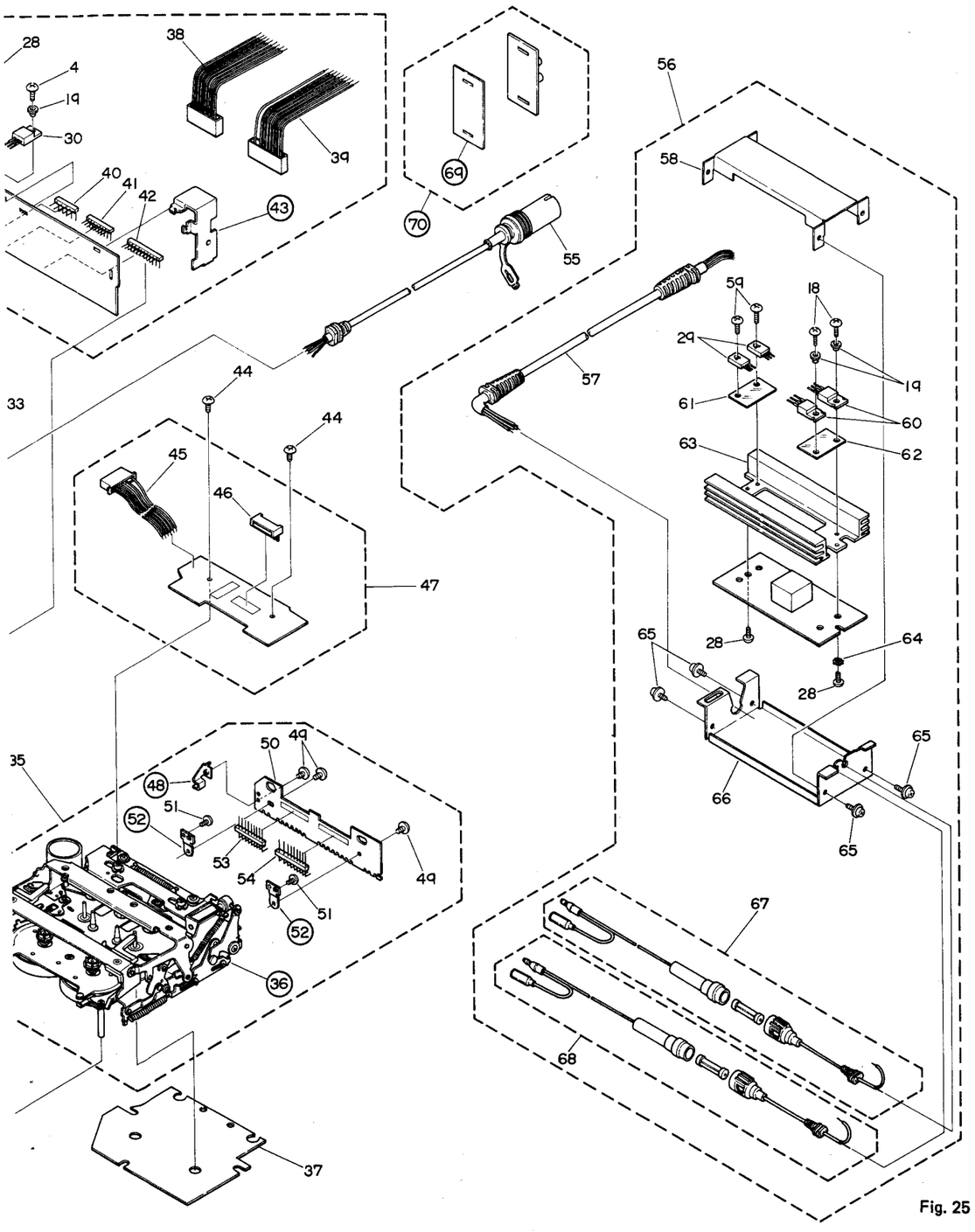


Fig. 25

- **Parts List**

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Mark	No.	Part No.	Description
	1.	CNM-696	Insulator
	2.	CWK-251	Audio Unit
★	3.	CDE-904	Connector
	4.	BMZ26P050FMC	Screw
	5.	WH26FMC	Washer
★	6.	CAC-363	Button (LOUDNESS)
	7.	CWX-385	Control Unit
	8.		Bracket
	9.	CBA-067	Nut M7
	10.	CBA-066	Nut M6
★★	11	CWS-109	Switch Assy
	12.	CKS-018	Connector
	13.	CNF-163	Holder
	14.	CDE-903	Connector
	15.	CDE-902	Connector
★★	16.	CSG-152	Switch (LOUDNESS)
★★	17.	CCS-275	Volume (VOLUME, BALANCE)
	18.	BMZ26P060FMC	Screw
	19.	B21-679	Bush
★★	20.	2SD313	Transistor
	21.	CNM-030	Insulator
	22.		Heat Sink
★★	23.	PA3009	IC
	24.	CDE-933	Connector
	25.	BMZ26P040FMC	Screw
★★	26.	CCS-274	Volume (BASS, TREBLE)
	27.	CWX-416	Mechanism Control Unit
	28.	BMZ30P050FMC	Screw
★★	29.	2SA715 or 2SB632 or 2SB632K	Transistor
★★	30.	2SD1061	Transistor
	31.	CNM-709	Insulator
	32.		Heat Sink
	33.	CNM-710	Insulator
	34.	VACANT	
	35.	CXC-262	Cassette Mechanism Assy
	36.		Cassette Mechanism Unit
	37.	CNM-707	Insulator
	38.	CDE-906	Connector
	39.	CDE-905	Connector
	40.	CKS-186	Plug (5P)
	41.	CKS-187	Plug (8P)
	42.	CKS-184	Plug (9P)
	43.		Holder
	44.	BMZ20P050FMC	Screw
	45.	CDE-912	Connector
	46.	CKS-183	Connector
	47.	WF-081	Pre Amp Unit
	48.		Cover
	49.	BMZ20P030FMC	Screw
	50.	CNP-929	P.C. Board
	51.	BMZ20P025FMC	Screw
	52.		Bracket
	53.	CKS-089	Plug (9P)
	54.	CKS-144	Plug (9P)
	55.	CDE-901	Connector
	56.	CWX-382	Driver Assy
★	57.	CDE-907	Cord
	58.	CNB-624	Case
	59.	BMZ30P060FMC	Screw
★★	60.	2SB596 or 2SB762 or 2SB507	Transistor
	61.	CNM-712	Insulator
	62.	CNM-711	Insulator
	63.	CNR-151	Heat Sink
	64.	WH30FMC	Washer
	65.	BBL30P080FBK	Screw
	66.	CNB-623	Case
★	67.	CDE-909	Cord (Orange)
★	68.	CDE-908	Cord (Yellow)
	69.		Insulator
	70.		ATSC Unit

11. CASSETTE MECHANISM EXPLODED VIEW (TOP)

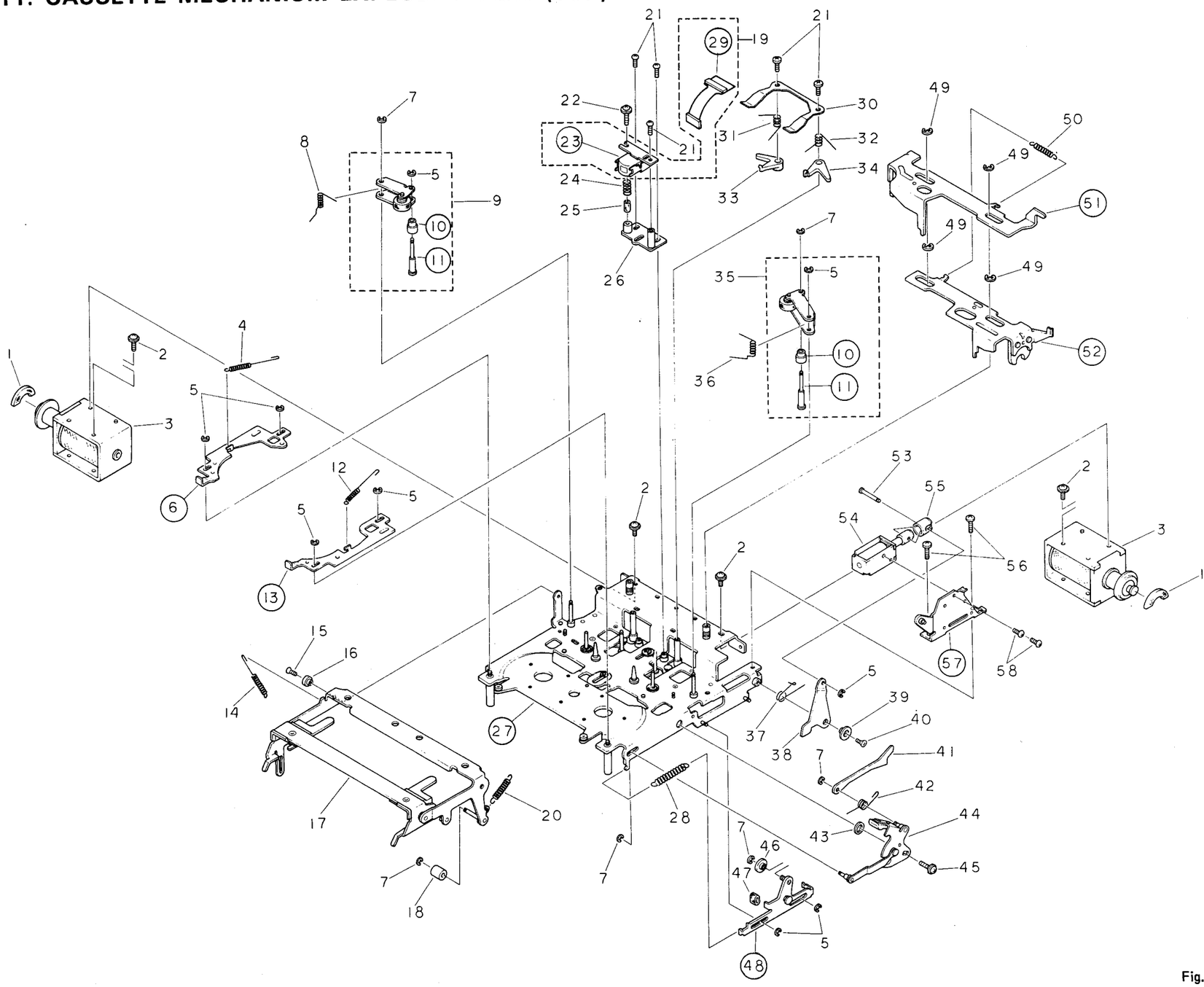


Fig. 26

- **Parts List**

Mark	No.	Part No.	Description
	1.	CNM-672	Spacer
	2.	PMS26P030FUC	Screw
★	3.	CXP-030	Solenoid
	4.	CBH-593	Spring
	5.	YE15FUC	Washer
	6.		Slide
	7.	YE20FUC	Washer
	8.	CBH-598	Spring
★★	9.	CXC-198	Pinch Holder Unit
	10.		Roller
	11.		Shaft
	12.	CBH-592	Spring
	13.		Slide
	14.	CBH-632	Spring
	15.	CMZ20P060FMC	Screw
	16.	CLB-048	Bush
	17.	CXC-205	Arm Unit
	18.	CLB-043	Roller
★★	19.	CXX-120	Head Unit
	20.	CBH-605	Spring
	21.	BMZ20P030FMC	Screw
	22.	CBA-108	Screw
	23.		Head
	24.	CBH-198	Spring
	25.	CNV-301	Azimuth Rubber
	26.	CXC-197	Head Base Unit
	27.		Chassis Unit
	28.	CBH-607	Spring
	29.		P.C. Board
	30.	CNE-921	Spring
	31.	CBH-600	Spring
	32.	CBH-599	Spring
	33.	CNW-174	Arm
	34.	CNW-175	Arm
★★	35.	CXC-285	Pinch Holder Unit
	36.	CBH-597	Spring
	37.	CBH-603	Spring
	38.	CNE-889	Cam
	39.	CLB-047	Bush
	40.	CMZ20P050FMC	Screw
	41.	CNE-887	Cam
	42.	CBH-604	Spring
	43.	WA52D080D050	Washer
	44.	CXC-203	Arm Unit
	45.	PMS20P040FUC	Screw
	46.	CLB-042	Roller
	47.	CNT-093	Spacer
	48.		Slide Unit
	49.	YE30FUC	Washer
	50.	CBH-594	Spring
	51.		Slide Unit
	52.		Slide Unit
	53.	CLB-013	Shaft
★	54.	CXP-031	Solenoid (Hold)
	55.	CNW-180	Cap
	56.	BMZ26P030FMC	Screw
	57.		Bracket Unit
	58.	PMZ20P025FMC	Screw

12. CASSETTE MECHANISM EXPLODED VIEW (BOTTOM)

Note:
- Please use motor removal screwdriver (GGK-083) to remove number 3 and number 6 reel motors.
- Please tighten firmly using the tightening lock when the number 4 reel unit is installed. When tightening, be careful not to drive the tightening lock into the motor axle.

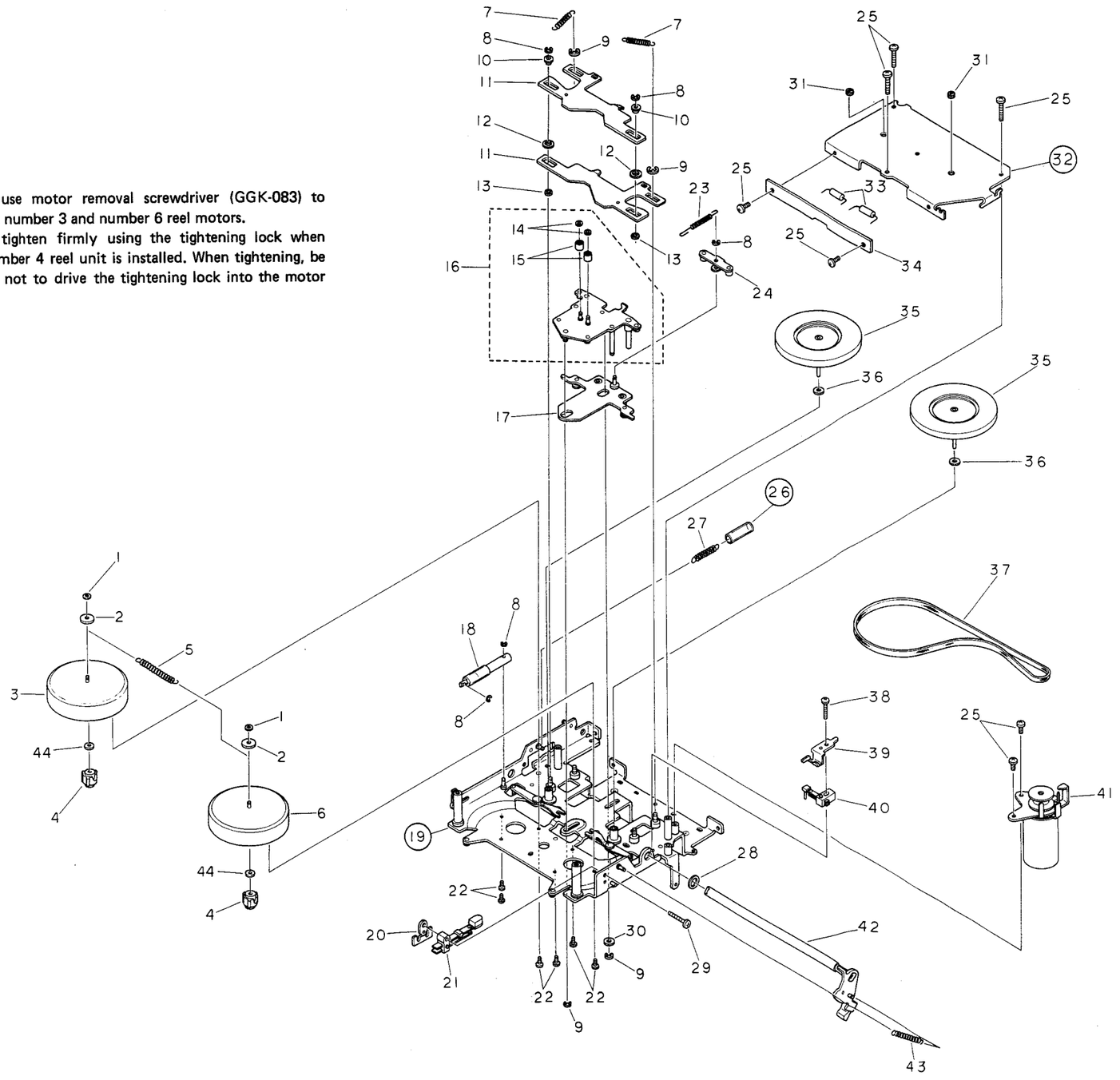


Fig. 27

• Parts List

Mark	No.	Part No.	Description
	1.	YE12FUC	Washer
	2.	WA17D032D050	Washer
★★	3.	CXM-071	Motor (Blue Lead)
★★	4.	CXC-332	Reel Unit
	5.	CBH-654	Spring
★★	6.	CXM-070	Motor (Red Lead)
	7.	CBH-596	Spring
	8.	YE15FUC	Washer
	9.	YE20FUC	Washer
	10	CLB-038	Roller
	11.	CNE-888	Cam
	12.	WA26D047D025	Washer
	13.	CLB-039	Roller
	14.	CBF-045	Washer
	15.	CLB-045	Roller
	16.	CXC-195	Slide Unit
	17.	CXC-194	Slide Unit
	18.	CXC-206	Damper Unit
	19.		Chassis Unit
	20	CNE-918	Cover
★★	21.	CSN-067	Switch (Power)
	22.	CBA-098	Screw
	23.	CBH-595	Spring
	24.	CXC-196	Cam Unit
	25.	BMZ20P030FMC	Screw
	26.		Vinyl Tube
	27.	CBH-608	Spring
	28.	WA52D080D050	Washer
	29.	PMZ20P080FMC	Screw
	30.	WC26FMC	Washer
	31.	CNV-984	Screw
	32.		Plate
	33.	CKPYD102M50	Capacitor
	34.	CNP-928	P.C. Board
	35.	CNR-140	Flywheel
	36.	WA21D040D025	Washer
★★	37.	CNT-097	Belt
	38.	BMZ20P080FMC	Screw
	39.	CNE-917	Cover
★★	40.	CSN-068	Switch (Cassette Detector)
★★	41.	CXX-116	Motor Unit
	42.	CXC-204	Arm Unit
	43.	CBH-606	Spring
	44.	CBF-136	Washer

Mark	Part No.	Symbol & Description	
	2SC2812-L6		
★★	2SD313	Q8	
★★	2SC2712-LG or 2SC2712-LL or 2SC2812-L6 or	Q28	Chip Transistor
	2SC2812-L7		
★★	2SD468-C or 2SC1383-R	Q217	
★	1S2473VH	D1, D3—D5	
★	1S2076 or	D2, D6, D215	
	1S1555		
★	MA151A-MA	D7	Chip Diode
★	MA151WK-MT	D209	Chip Diode
★	CCX-010	TH1	Posistor
	CWW-106	X1	Ceramic Resonator (1 set pair)
★★	CWS-109	Switch Assy	
★★	CCP-212	VR1	Semi-fixed, 68kΩ(B)
★★	CCS-274	VR202, VR203	Volume, 100kΩ(B) (BASS, TREBLE)

RESISTORS

Mark	Part No.	Symbol & Description	
	RS1/8S □□□J	R1—R7, R9—R12, R14, R15, R17—R36, R40—R90, R94, R232, R259—R270, R281, R282, R284—R288, R297, R298, R304	Chip Resistor
	RD¼VM □□□J	R8, R13, R91, R93	
	CCN-111	R16	0.47Ω
	RD¼PM □□□J	R37—R39	
	RD1/6PS □□□J	R92	

CAPACITORS

Mark	Part No.	Symbol & Description	
	CKSYB102K 50	C1, C10	Chip Capacitor
	CEA100M 16L	C2, C15, C251, C252, C263	
	CEA2R2M 50L	C3, C12	
	CKDBC563K 25	C4, C5	
	CCE-020	C6	8200pF
	CKDBC473M 25	C7	
	CEA010M 50L	C8	
	CEA3R3M 50L	C9	
	CQMA103J 50L	C11	
	CKDBC223K 25	C13	
	CEA220M 16L	C14	
	CKSYB103K 50	C16—C18	Chip Capacitor
	CQMA104J 50L	C19	
	CEA101M 6R3L	C20	
	CEA330M 16L	C21	
	CEA470M 10L	C22	
	CEANL4R7M35LL	C241, C242	
	CQMA102K 50L	C243, C244, C247, C248	
	CQMA223K 50L	C245, C246	
	CCSSL330J 50	C249, C250	Chip Capacitor
	CSZA100K 16	C265	

Mechanism Control Unit (CWX-416)

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	PA0003	IC1
★★	2SC1815 or 2SC945 or 2SC1740LN or 2SC536NP or	Q1, Q2, Q4, Q8—Q10, Q12, Q13
	2SC828 or 2SC2634-R	
★★	2SD468 or 2SC1383	Q3
★★	2SA1015 or	Q5
	2SA733 or 2SA608NP or 2SA608KNP	
★★	2SD1061	Q6
★★	2SA950	Q7
★★	2SA715 or 2SB632 or 2SB632K	Q11
★★	2SC2001 or 2SD734	Q14, Q15
★	1S2076 or 1S1555 or 1S2473VH or DS442 or US1040 or	D1—D4, D6
	WG-713	
★	YZ-074A	D5, D7
★	XZ-064	D8
	CWW-105	IB1, IB2
★★	CCP-141	VR1, VR2 Semi-fixed, 2.2kΩ(B)
★★	CCP-142	VR3, VR4 Semi-fixed, 3.3kΩ(B)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼VM □□□J	R91—R94, R96—R104, R106, R107, R112—R114, R116, R117, R120, R122, R123, R125—R127, R129—R143, R145—R149
	RD¼PM □□□J	R95
	RD1/2PS □□□J	R105, R115
	CCN-099	R108—R111 5.1kΩ
	RD¼PS □□□J	R118, R119, R124, R128
	CCN-110	R121, R144 2.7kΩ

CAPACITORS

Mark	Part No.	Symbol & Description
	CKPVYB102K 50	C31, C36, C41
	CEAR33M 50NP	C32, C46
	CEA010M 50LL	C33, C40, C43, C51, C52
	CKPVYB821K 50	C34
	CKPVYV152K 50	C35

Mark	Part No.	Symbol & Description
	CEA010M35NP	C37, C38
	CEA330M 16	C39
	CQMA123K 50L	C42
	CEA470M 10L	C44
	CSYA0R1M25SAN	C45, C57
	CEA100M 16L	C47, C50
	CEA101M 10L	C48, C53
	CEA471M 16L	C49
	CQMA822J 50L	C54, C55
	CKDYB151K 50L	C56
	CKPVYB102K 50	C58
	CKPYB102K 50	C59

P. C. Board

Mark	Part No.	Symbol & Description
★	DS135D or DS135C	D1—D4
	CEA3R3M25NP	C1

ATSC Unit

Mark	Part No.	Symbol & Description
★★	2SA1048-GR or 2SA1175 or 2SA608SP-F	Q1
★★	2SC2458 or 2SC2785 or	Q2, Q3
	2SC536SP	
★	1S1555 or 1S2076	D1, D2
	RD1/6PS □□□J	R1—R4

Miscellaneous Parts List

Mark	Part No.	Symbol & Description	
	CKPYD102M50	C41, C43	
★★	CSN-067	S1	Switch (Power)
★★	CSN-068	S2	Switch (Cassette Detector)
★	CXP-031	SO1	Solenoid(Cassette Hold)
★	CXP-030	SO2, SO3	Solenoid (F/R)
★★	CXX-120	Head Unit	
★★	CXM-071	RM1	Motor (Reel)
★★	CXM-070	RM2	Motor (Reel)
★★	CXX-116	CM	Motor Unit (Capstan)
	CXC-371	Door Unit	

14. PACKING METHOD

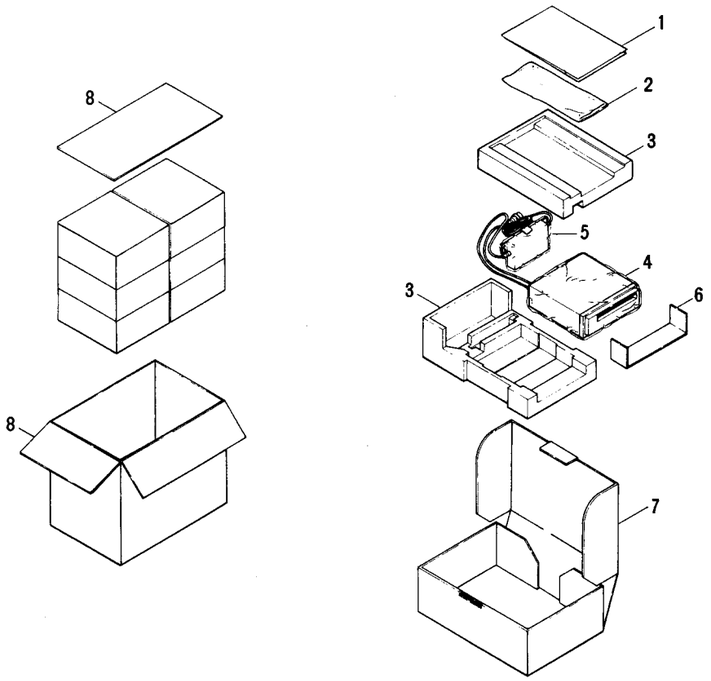


Fig. 28

Parts List

Mark	No.	Part No.	Description
	1.		Card (KP-909G/US)
			Card (KP-909G/CA)
		CRB-422	Owner's Manual (KP-909G/US) (English)
		CRD-206	Owner's Manual (KP-909G/CA) (English, French)
		CRD-207	Owner's Manual (KP-909G/E) (English, French, German, Spanish)
		CRD-208	Owner's Manual (KP-909G/E) (Norwegian, Swedish, Dutch, Italian)
	2.	CEA-516	Accessory Kit
	2-1.	CNF-111	Strap
	2-2.	CDE-437	Cord
	2-3.	CEA-515	Screw Kit
	2-3-1.	CBA-028	Screw for Strap
	2-3-2.	CBA-101	Screw, M4 X 6
	2-3-3.	CBA-102	Screw, M5 X 16
	2-3-4.	B70-055	
	2-3-5.	B70-056	
	2-3-6.	WS40FMC	Washer
	2-3-7.	BML30P060FBK	Screw
	2-3-8.	BNC30P100FMC	Screw
	3.	CHC-260	Styrofoam (1 set pair)
	4.	CEG-113	Cover
	5.	CEG-167	Cover
	6.	CNB-198	Mounting Bracket
	7.	CHC-255	Carton (KP-909G/US)
		CHC-257	Carton (KP-909G/CA)
		CHC-258	Carton (KP-909G/E)
	8.	CHC-256	Contain Box (KP-909G/US, CA)

13. ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10^1*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10^3*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*OR5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10^1 ..... RN1/4SR 5 6 2 1 F

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★*
  ★★: GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Audio Unit (CWK-251)

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	HA11226	IC202
★★	KHA102	IC204
★★	2SC2458 or 2SC2785 or 2SC536SP or 2SC828 or 2SC2634 or 2SC1815 or 2SC945 or 2SC1740LN	Q209, Q210, Q221
★★	2SA1048 or 2SA1175	Q211, Q212
★★	2SC2458 or 2SC2785 or 2SC536SP	Q215, Q216, Q219
★★	2SC2634 or 2SC828 or 2SC536NP or 2SC1740 or 2SC945 or 2SC1815	Q220, Q222
★	1N34A	D203, D204
★	1S2076	D205, D206
★	1S1555 or 1S2076 or 1S2473VH or DS442 or US1040 or WG-713	D207, D208
★	XZ-068	D211
★	XZ-088	D212
★★	CCP-145	VR201 Semi-fixed, 10kΩ(B)
★★	CCS-275	VR204 Volume, 20kΩ(B), 50kΩ(MN) (VOLUME, BALANCE)
★★	CSG-152	S201 Switch (LOUDNESS)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼VM □□□J	R233, R235–R258, R272–R278, R289–R292, R294–R296
	RD¼PM □□□J	R234, R271, R279, R280, R293
	RD¼PS □□□J	R299
	CCN-056	R300–R303 0Ω

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA153J 50L	C221, C222, C235–C238
	CEANL3R3M 50L	C223, C224
	CEAH3R3M 50L	C225, C226
	CSYA0R1M25SAN	C227, C228
	CSYAR33M25SAN	C229, C230, C234
	CQMA472J 50L	C231, C232
	CEANLR33M50LL or CSZAR33M 35	C233
	CEANL4R7M 25L	C239, C240
	CQMA152K 50L	C253, C254
	CSYAR15M25SAN	C255, C256
	CEA010M 50L	C257, C258
	CEANLR33M50LL or CSYAR33M25SAN	C259, C260
	CEA471M 16L	C261, C273

Mark	Part No.	Symbol & Description
	CEA101M 10L	C262, C269–C272
	CEA220M 10L	C264
	CEA101M 16L	C266
	CEA470M 16L	C267, C268
	CEA330M 16L	C274
	CQMA104J 50L	C275, C276
	CEA471M 10L	C277

Pre Amp Unit (CWF-081)

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	MB3106MF	IC201
★★	2SK198-1OP or 2SK198-1OQ or 2SK209-XG or 2SK209-XY	Q201–Q204 Chip Transistor
★★	2SB709-AO or 2SB709-AP or 2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1162-SY or 2SA1162-SG or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7	Q205, Q206 Chip Transistor
★★	2SD601-YO or 2SD601-YP or 2SD601-YQ or 2SD601-YR or 2SD601 YS or 2SC2712-LY or 2SC2712-LG or 2SC2712-LL or 2SC2812-L5 or 2SC2812-L6	Q207 Chip Transistor
★	MA151WK-MT	D201, D202 Chip Diode
★★	CCP-182	VR201–VR204 Semi-fixed, 22kΩ(B)

RESISTORS

Mark	Part No.	Symbol & Description
	RS1/8S □□□J	R201–R204, R209–R212, R219–R231, R305 Chip Resistor
	RD1/6PS □□□J	R205–R208, R213–R218
	RS1/8S □□□K	J1–J8 0Ω Chip Resistor

CAPACITORS

Mark	Part No.	Symbol & Description
	CKSYB821K 50	C201–C204 Chip Capacitor
	CEANL4R7M35LL	C205–C208
	CEANLR47M50LL or CSZAR47M 35	C209, C210, C213, C214
	CSZAR47M 35	C211, C212
	CEA470M6LL	C215, C216
	CQMA103J 50L	C217, C218
	CKSYF222Z 50	C219 Chip Capacitor
	CEA221M 10L	C220

Driver Assy (CWX-382)

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	2SA715 or 2SB632 or 2SB632K	Q1, Q2
★★	2SB596 or 2SB762 or 2SB507	Q3, Q4
★	1S1886 or SIB01-02	D1, D2
	CTH-069	L1 Coil, 0.5mH

RESISTORS

Mark	Part No.	Symbol & Description
	RD1/6PS □□□J	R1–R4

CAPACITOR

Mark	Part No.	Symbol & Description
	CCH-071	C1 330μF/16V

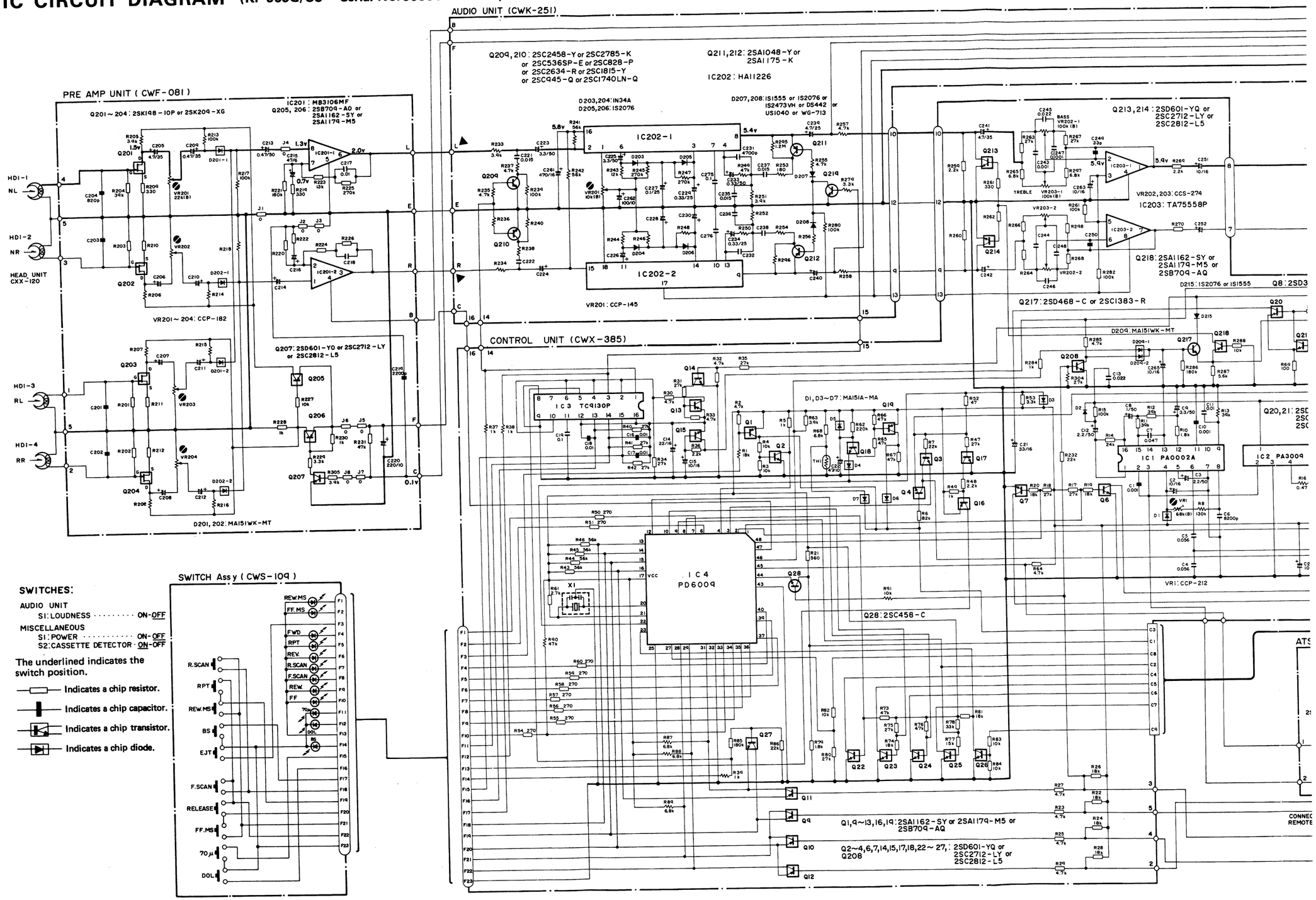
Control Unit (CWX-385)

MISCELLANEOUS

Note: Replace X1 as 1 set.

Mark	Part No.	Symbol & Description
★★	PA0002A	IC1
★★	PA3009	IC2
★★	TC9130P	IC3
★★	PD6009A	IC4
★★	TA75558P	IC203
★★	2SA1162-SY or 2SA1162-SG or 2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7	Q1, Q9–Q13, Q16, Q19, Q218 Chip Transistor
★★	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LY or 2SC2712-LG or 2SC2712-LL or 2SC2812-L5 or	Q2–Q4, Q6, Q7, Q14, Q15, Q17, Q18, Q20–Q27, Q208, Q213, Q214 Chip Transistor

15. SCHEMATIC CIRCUIT DIAGRAM (KP-909G/US – Serial No. 00001 ~ 01000, KP-909G/E – Serial No. 00001 ~ 04000)


AUDIO UNIT (CWK-251)
PRE AMP UNIT (CWF-081)
Q201 ~ 204 : 2SK198 - IOP or 2SK209 - XG
IC201 : MB3106MF
Q205, 206 : 2SB709 - AQ or 2SA1162 - SY or 2SA1179 - M5
Q209, 210 : 2SC2458 - Y or 2SC2785 - K or 2SC536SP - E or 2SC828 - P or 2SC2634 - R or 2SC1815 - Y or 2SC945 - Q or 2SC1740LN - Q
Q211, 212 : 2SA1048 - Y or 2SA1175 - K
IC202 : HA11226
D203, 204 : 1N34A
D205, 206 : 1S2076
D207, 208 : 1S1555 or 1S2076 or IS2473VH or DS442 or USI040 or WG-713
Q213, 214 : 2SD601 - YQ or 2SC2712 - LY or 2SC2812 - L5
Q218 : 2SA1162 - SY or 2SA1179 - M5 or 2SB709 - AQ
Q217 : 2SD468 - C or 2SC1383 - R
IC203 : TA75558P
VR202, 203 : CCS - 274
VR201 ~ 204 : CCP - 182
VR201 : CCP - 145
HDI - 1 NL
HDI - 2 NR
HDI - 3 RL
HDI - 4 RR
HEAD UNIT CXX - 120
Q207 : 2SD601 - YQ or 2SC2712 - LY or 2SC2812 - L5
D201, 202 : MA151WK - MT
D215 : 1S2076 or 1S1555
D209 : MA151WK - MT
CONTROL UNIT (CWX - 385)
IC3 TC9130P
IC4 PD6009
IC1 PA0002A
IC2 PA3009
D1, D3 ~ D7 : MA151A - MA
Q28 : 2SC458 - C
VR1 : CCP - 212
Q1, 9 ~ 13, 16, 19 : 2SA1162 - SY or 2SA1179 - M5 or 2SB709 - AQ
Q2 ~ 4, 6, 7, 14, 15, 17, 18, 22 ~ 27, Q208 : 2SD601 - YQ or 2SC2712 - LY or 2SC2812 - L5
SWITCH Ass y (CWS - 109)
REW.MS
FF.MS
F.WD
RPT
REV.
R.SCAN
F.SCAN
REW.
FF
70μ
DOL
BS
EJT
RELEASE

SWITCHES:

AUDIO UNIT
- S1: LOUDNESS ····· ON-OFF

MISCELLANEOUS
- S1: POWER ····· ON-OFF
- S2: CASSETTE DETECTOR · ON-OFF

The underlined indicates the switch position.

- Indicates a chip resistor.
- Indicates a chip capacitor.
- Indicates a chip transistor.
- Indicates a chip diode.

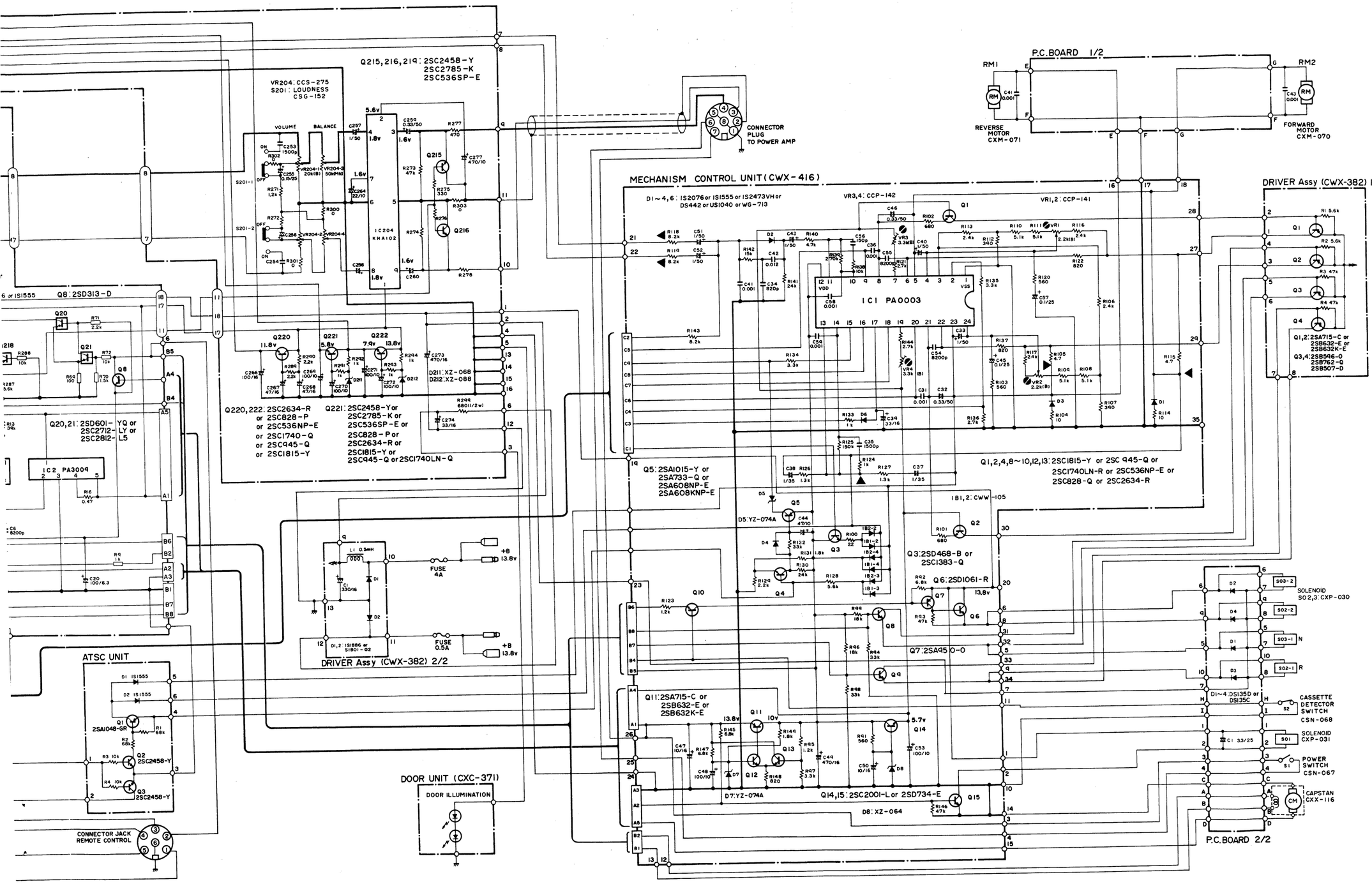

MECHANISM CONTROL UNIT (CWX-416)
P.C.BOARD 1/2
DRIVER Assy (CWX-382) 1/2
DRIVER Assy (CWX-382) 2/2
ATSC UNIT
DOOR UNIT (CXC-371)
P.C.BOARD 2/2
IC1 PA0003
IC2 PA3004
IC204 KHA102
CONNECTOR PLUG TO POWER AMP
CONNECTOR JACK REMOTE CONTROL
REVERSE MOTOR CXM-071
FORWARD MOTOR CXM-070
DOOR ILLUMINATION
FUSE 4A
FUSE 0.5A
+B 13.8v
VR204: CCS-275
S201: LOUDNESS CSG-152
VOLUME
BALANCE
Q215,216,219: 2SC2458-Y or 2SC2785-K or 2SC536SP-E
Q220,222: 2SC2634-R or 2SC828-P or 2SC536NP-E or 2SCI740-Q or 2SC945-Q or 2SCI815-Y
Q221: 2SC2458-Y or 2SC2785-K or 2SC536SP-E or 2SC828-P or 2SC2634-R or 2SCI815-Y or 2SC945-Q or 2SCI740LN-Q
D211: XZ-068
D212: XZ-088
Q20,21: 2SD601-YQ or 2SC2712-LY or 2SC2812-L5
Q8: 2SD313-D
D1~4,6: IS2076 or ISI555 or IS2473VH or DS442 or USI040 or WG-713
VR3,4: CCP-142
VR1,2: CCP-141
Q1,2,4,8~10,12,13: 2SCI815-Y or 2SC945-Q or 2SCI740LN-R or 2SC536NP-E or 2SC828-Q or 2SC2634-R
Q5: 2SAI015-Y or 2SA733-Q or 2SA608NP-E or 2SA608KNP-E
D5: YZ-074A
IB1,2: CWW-105
Q3: 2SD468-B or 2SCI383-Q
Q6: 2SD1061-R
Q7: 2SA950-O
Q11: 2SA715-C or 2SB632-E or 2SB632K-E
Q14,15: 2SC2001-L or 2SD734-E
D8: XZ-064
D7: YZ-074A
Q1,2: 2SA715-C or 2SB632-E or 2SB632K-E
Q3,4: 2SB546-O or 2SB762-Q or 2SB507-D
SOLENOID S02,3: CXP-030
SOLENOID CXP-031
CASSETTE DETECTOR SWITCH CSN-068
POWER SWITCH CSN-067
CAPSTAN CXX-116
DI~4: DSI35D or DSI35C

Fig. 29

16. CONTROL UNIT (CWX-385) (KP-909G/US — Serial No. 00001 ~ 01000, KP-909G/E — Serial No. 00001 ~ 04000)

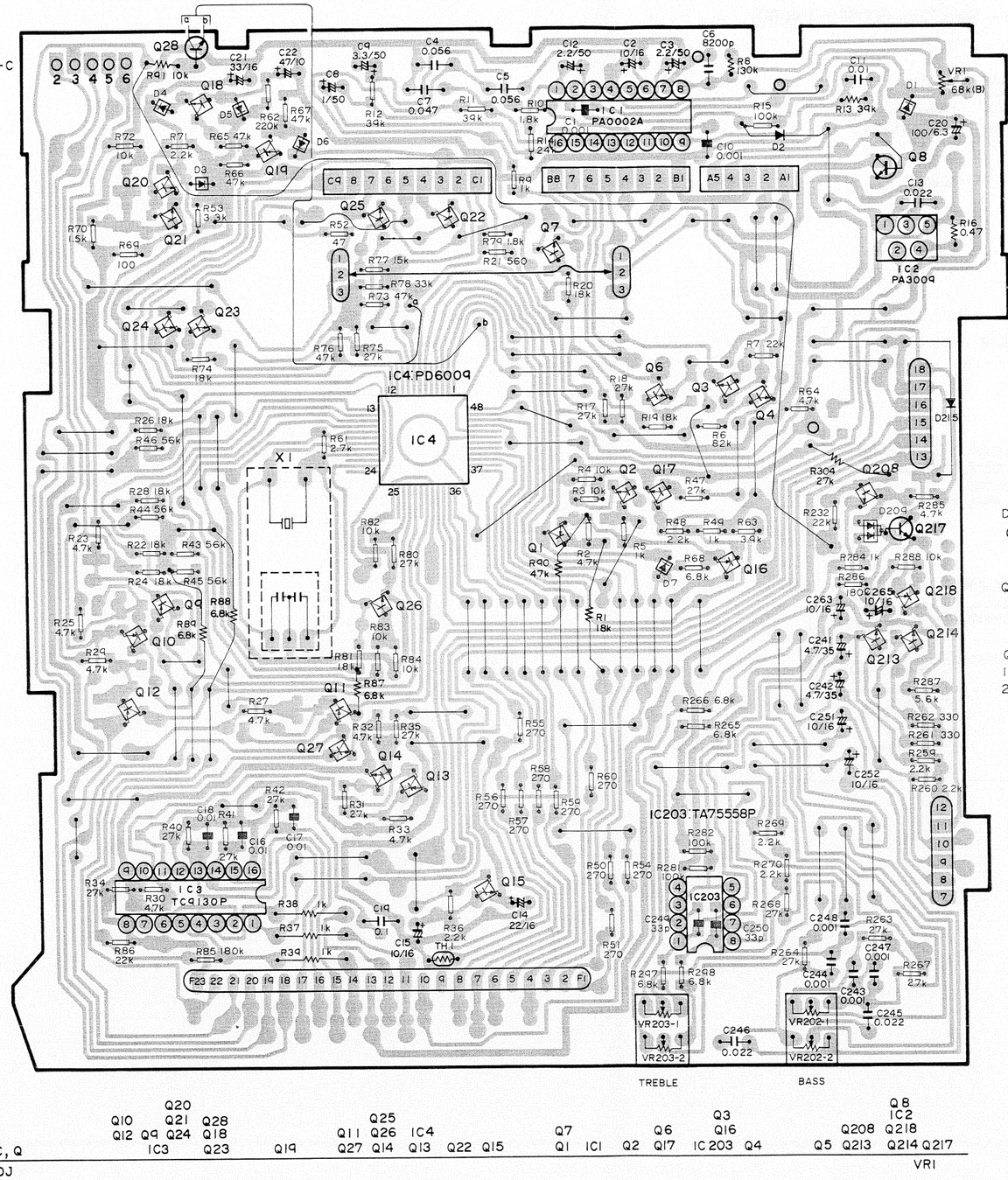


Fig. 30

17. PARTS LIST (KP-909G/US – Serial No. 00001 ~ 01000, KP-909G/E – Serial No. 00001 ~ 04000)

Control Unit (CWX-385)

MISCELLANEOUS

Note: Replace X1 as 1 set

Mark	Part No.	Symbol & Description
★★	PA0002A	IC1
★★	PA3009	IC2
★★	TC9130P	IC3
★★	PD6009	IC4
★★	TA75558P	IC203
★★	2SA1162-SY or 2SA1162-SG or 2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1179-M5 or 2SA1179-M6 or 2SA1179-M7	Q1, Q9–Q13, Q16, Q19, Q218 Chip Transistor
★★	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LY or 2SC2712-LG or 2SC2712-LL or 2SC2812-L5 or 2SC2812-L6	Q2–Q4, Q6, Q7, Q14, Q15, Q17, Q18, Q20–Q27, Q208, Q213, Q214 Chip Transistor
★★	2SD313	Q8
★★	2SC458	Q28
★★	2SD468-C or 2SC1383-R	Q217
★	MA151A-MA	D1, D3–D6 Chip Diode
★	1S2076 or 1S1555	D2, D215
★	MA151A-MA	D7 Chip Diode
★	MA151WK-MT	D209 Chip Diode
	CCX-010	TH1 Posistor
	CWW-106	X1 Ceramic Resonator (1 set pair)
★★	CWS-109	Switch Assy
★★	CCP-212	VR1 Semi-fixed, 68kΩ(B)
★★	CCS-274	VR202, VR203 Volume, 100kΩ(B) (BASS, TREBLE)

RESISTORS

Mark	Part No.	Symbol & Description
	RD1/6PS □□□J	R1, R87–R90, R304
	RS1/8S □□□J	R2–R7, R9–R12, R14, R15, R17–R36, R40–R86, R232, R259–R270, R281, R282, R284–R288, R297, R298 Chip Resistor
	RD¼VM □□□J	R8, R13, R91
	CCN-111	R16 0.47Ω
	RD¼PM □□□J	R37–R39

CAPACITORS

Mark	Part No.	Symbol & Description
	CKSYB102K 50	C1, C10 Chip Capacitor
	CEA100M 16L	C2, C15, C251, C252, C263
	CEA2R2M 50L	C3, C12
	CKDBC563K 25	C4; C5
	CCE-020	C6 8200pF
	CKDBC473M 25	C7
	CEA010M 50L	C8
	CEA3R3M 50L	C9
	CQMA103J 50L	C11
	CKDBC223K 25	C13
	CEA220M 16L	C14
	CKSYB103K 50	C16–C18 Chip Capacitor
	CQMA104J 50L	C19
	CEA101M 6R3L	C20
	CEA330M 16L	C21
	CEA470M 10L	C22
	CEANL4R7M35LL	C241, C242
	CQMA102K 50L	C243, C244, C247, C248
	CQMA223K 50L	C245, C246
	CCSSL330J 50	C249, C250 Chip Capacitor
	CSZA100K16	C265

Mechanism Control Unit (CWX-416)

		Serial No.00001~01000 (KP-909G/US) Serial No.00001~04000 (KP-909G/E)	Serial No.01001~ Serial No.04001~
Mark	Symbol	Part No.	Part No.
★★	VR1, VR2 R116, R117	CCP-141 RD¼VM242J	CCP-139 RD¼VM272J